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January 21, 1873.

Prof. Newton, F.R.S., V.P., in the Chair.

Dr. Günther exhibited and made remarks upon an Egyptian skull which had been discovered in the tombs of Sakhara, near Memphis, in Egypt, by Mr. John Dickson, in March 1872.

The following papers were read:—

1. On the Classification of the *Achatinellinæ*.

By the Rev. John T. Gulick.

[Received November 19, 1872.]

When Dr. Pfeiffer first divided the genus *Achatinella* he was not altogether successful in separating the species into natural groups. Much disorder has since been removed by the recognition of the group *Amastra* by H. & A. Adams, and by Von Martens having separated from *Achatinella* and *Bulimella* the quite distinct group for which he has proposed the name *Apex*.

Mr. Pease* has proposed to call the same group by the name *Helicter*, which he ascribes to Férussac. He was mistaken, however, in the supposition that Férussac's use of the form "*Helicteres*" had escaped the attention of other conchologists. Dr. Pfeiffer has referred to it, but there were sufficient reasons why he should not use it. Beck and some others have followed Férussac in adopting the plural form of the word, while Pease uses the singular; but whether the singular or the plural, it has been preoccupied as the name of a genus in the vegetable kingdom. We might hesitate to reject it if it had been in general use for many years; but no good reason exists for reviving an objectionable name which has long been rejected.

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* See Proc. Zool. Soc. 1869, p. 644.

The group of small species provided with an internal lamella resting upon the inner wall of the shell has already been removed from the genus *Partula* by Dr. Pfeiffer. He has rightly estimated their claim to a separate name, and to a place amongst the Achatinellinæ. They should undoubtedly be regarded as a distinct genus, and under Pfeiffer's name *Auriculella* they will probably be received as such.

The group of large turreted species found only on the island of Kauai, classed sometimes as *Achatina*, sometimes as *Achatinella*, sometimes as *Spiraxis*, finds its true place as a distinct genus under the name *Carelia* (H. & A. Adams). This group, as well as *Auriculella*, should have a place in the Achatinellinæ, but separate from the genus *Achatinella*.

With the addition of these forms, the Achatinellinæ may be regarded as consisting of ten genera or convenient divisions. Seven of these are arboreal, and three of them terrestrial genera.

ACHATINELLINÆ.

A. *Arboreal Genera.*

1. ACHATINELLA, Swainson.

Syn. *Achatinellastrum*, Pfeiffer.

Hab. Chiefly on the island of Oahu; also on Molokai.

Type *Achatinella vulpina*, Fér. *Hab.* Pauoa, on Oahu.

2. BULIMELLA, Pfeiffer.

Hab. Oahu.

Type *Bulimella rosea*, Swain. *Hab.* Wahiawa and Helemano, Oahu.

3. APEX, Von Martens.

Hab. Island of Oahu.

Type *Apex decora* Fér. (syn. *H. perversa*, Sw.). *Hab.* Kawailoa, on Oahu.

4. LAMINELLA, Pfeiffer.

Hab. Oahu, Maui, Molokài, and Lanai.

Type *Laminella gravida*, Fér. *Hab.* East end of Oahu.

5. PARTULINA, Pfeiffer.

Hab. Oahu, Maui, Molokai, and Lanai.

Type *Partulina virgulata*, Migh. *Hab.* Molokai.

Section PERDICELLA, Pease.

Partulina mauiensis, Newc. *Hab.* Maui.

Section EBURNELLA, Pease.

Partulina variabilis, Newc. *Hab.* Island of Lanai.

Pease has given the name *Eburnella* to a few small species from the island of Oahu, together with some of about the same size, but of very different character, from Lanai. The former are connected with the typical forms of *Achatinella* by several lines of complete gradation of type. The latter are a section of *Partulina*, but not sc completely connected.

6. NEWCOMBIA, Pfeiffer.

Hab. Maui and Molokai.
Type *Newcombia cumingi*, Newc. *Hab.* Maui.

7. AURICULELLA, Pfeiffer.

Hab. Oahu, Maui, Molokai, and Lanai.
Type *Auriculella auricula*, Fér. *Hab.* Manoa and Palolo, on Oahu.

Section FRICKELLA, Pfeiffer.

Auriculella amœna, Pfr. *Hab.* Oahu.

B. *Terrestrial Genera.*

8. CARELIA, H. & A. Adams.

Hab. Island of Kauai.
Type *Carelia adusta*, Gould.

9. AMASTRA, H. & A. Adams.

Hab. All the Sandwich Islands.
Type *Amastra magna*, C. B. Adams. *Hab.* Lanai.

10. LEPTACHATINA, Gould.

Hab. All the Sandwich Islands.
Type *Leptachatina acuminata*, Gould.

Section LABIELLA, Pfeiffer.

Leptachatina labiata, Newc. *Hab.* Lehui, on Oahu.

I add some corrections relating to species described by me in the 'Transactions of the New-York Lyceum of Natural History.' Three of these species I find had been previously described; therefore *Leptachatina granifera*, mihi, is a syn. of *L. margarita*, Pfr.; *Bulimella limbata*, mihi, is a syn. of *B. byronii*, Wood; *Achatinella dimorpha*, mihi, is a syn. of *A. curta*, Newc.

The rest of the seventy-three species described at that time, I find, after comparison of all the typical specimens in the British Museum and of all the descriptions published, to be good species.

2. On the Visceral Anatomy of the Sumatran Rhinoceros (*Ceratorhinus sumatrensis*). By A. H. Garrod, B.A., F.Z.S., Prosector to the Society.

[Received December 5, 1872.]

The death on September 21st, 1872, of the only English specimen of the Sumatran Rhinoceros has afforded me an opportunity of determining many points in its anatomy previously unknown; and Prof. Owen's excellent memoir on *Rhinoceros indicus*, in the fourth volume of the Society's 'Transactions,' has made it possible to compare the details of structure in the two species.

The differences in the shape of the stomach, and the character of the mucous membrane of the small intestine, together with the peculiarities of the skin, including the presence of a second horn, the absence of a gland behind the foot, and the smallness of the folds, which cannot accurately be termed shields, appear to me quite to justify the separation, into a distinct genus, of the Sumatran Rhinoceros from its Indian ally, as has been done by Dr. Gray from a study of its osteology only.

The specimen upon which these observations are based is said to have been captured in Malacca*: it is an aged female: its skin is of a dark slate-colour, and is covered thinly with black hairs, which are more than an inch long, situated mostly on the middle line of the back and on the outer sides of the limbs. Its length from the tip of the nose to the base of the tail is 96½ inches. The tail is 22 inches long; from its base to the transverse shoulder-fold is 44 inches; and from the latter to the occipital crest is 22 inches. The ears are lined, and not fringed (as are those of *Ceratorhinus lasiotis*) with black hairs. No traces could be found at the back of the feet of the glands described by Prof. Owen in the Indian Rhinoceros.

The skull, the only part of the skeleton which I have examined, is 21⅞ inches from the tip of the nasal bones to the middle of the occipital crest, following its longitudinal direction. From one lachrymal tubercle over the head to that of the opposite side is 8 inches. The conjoined nasal bones in their broadest part are 6⅜ inches across from their lower margins over the insertion of the anterior horn.

The lower incisors and the first premolars are lost; Prof. Flower informs me that a specimen in the Museum at Brussels has also lost its lower incisors. The premaxillary bones are anchylosed to the maxillaries, a condition I have not found in any other specimen, and which is probably dependent on the loss of the lower cutting-teeth.

Including the present one, I have seen eight skulls of Asiatic two-horned Rhinoceroses (*Ceratorhinus*)—four in the College-of-Surgeons Museum, two in the British Museum, and one at the Museum at Cambridge. The present specimen agrees very closely with that at the last-named place, and with No. 1461 *a*, adult, from Pegu, in the British Museum. It being that of an aged individual, comparison with most of the others referred to is more difficult, as they are nearly all immature. The skeleton mounted at the College of Surgeons, No. 2933, obtained by Sir S. Raffles from Sumatra, is aged also; but there are points in which it differs materially from the present specimen. It is of slighter build, and the nasal bones are narrower.

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* See for an account of its history Mr. Sclater's notes, P. Z. S. 1872, p. 494.

A much larger skull, not quite adult, in the Museum of the College of Surgeons, No. 2935, stated to be that of a "male Sumatran Rhinoceros," and presented by Sir S. Raffles, is evidently from a larger animal, and agrees also with *Ceratorhinus lasiotis* in being proportionally broader in the parietal regions. In this skull also the posterior of the submental foramina is situated in front of the second premolar; while in all the others (except No. 2936, R.C.S., which is young, but peculiarly massive) it is situated, when present, behind that tooth.

Subjoined is a table giving a few of the measurements in the skulls above referred to:—

	No. 2935, R. C. S.	Zool. Soc. specimen.	No. 1461*a*, B. Mus.	No. 2933, R. C. S.	Cambridge specimen.
	in.	in.	in.	in.	in.
Length of skull from tip of nasals to middle of occipital crest	23	21·875	21·925	21·25	22·125
Breadth across nasal bones	5·25	6·375	..	4·75	6·75
Length of 2nd upper molar at base	2	1·775	1·7	1·6	
Length of 1st upper molar at base	1·75	1·5	1·375	1·35	
Length of 4th upper premolar at base	1·6	1·25	1·255	1·225	

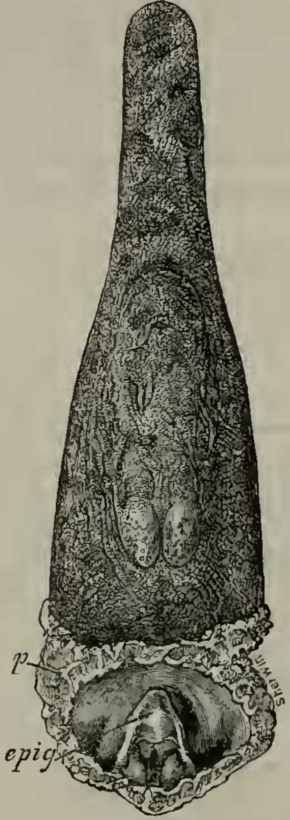
The following is an account of the various features of the viscera that were observed in the Sumatran Rhinoceros.

Alimentary Canal.—The palate, which is covered with a smooth epithelium, is marked by conspicuous transverse angular ridges. There are eleven of these on each side; and they are not continuous anteriorly across the middle line, but the prominences of one side are carried on as the fossæ on the other. The posterior ridges are continuous from one side to the other; and they, instead of being transverse as are those in front, are arranged in the form of a V, the concavity of the V being directed forwards. On the soft palate, which is $4\frac{3}{4}$ inches long, these ridges disappear. The palate is narrow, as can be readily seen by an inspection of the skull; anteriorly its breadth is $2\frac{3}{4}$ inches, and posteriorly $3\frac{1}{2}$ inches, gradually increasing from before backwards.

In no part of the alimentary canal, except on the surface of the tongue, were there any papillæ visible to the naked eye.

The *cheeks* form pads on either side composed of areolar and muscular tissue, which project into the cavity of the mouth. These pads are shaped like prominent blunted triangles, with their apices directed forwards; they are 3½ inches deep behind, where they are lost on the fauces, and they are about 9 inches long. The epithelium covering them is nearly smooth, and is very thick.

Fig. 1.



Tongue of *C. sumatrensis* (superior surface).
p, soft palate, embracing the root of the tongue; *epig*, epiglottis.

The *tongue* is elongate, and in shape much like that of the Ruminants, being thin from above downwards in front, and deep behind, with a somewhat sudden transition from one to the other. From the apex to the posterior of the circumvallate papillæ is 15 inches, and from the epiglottis to the same papillæ is 2¾ inches. In the middle of the anterior thin portion the breadth is 2¾ inches, and in the middle of the posterior moiety it is 4½ inches.

There are many circumvallate papillæ, 33 on one side and 26 on the other, forming two clusters separated by a smooth median longitudinal line. Each cluster is triangular in shape; and the two acute-angled triangles they form lie side by side and have their apices directed backwards. The individual papillæ which go to form them are largest posteriorly, reaching a diameter of $\frac{1}{6}$ inch; anteriorly they get smaller, and cease by becoming more and more scattered. The rest of the tongue is covered uniformly with filiform papillæ, among which no fungiformes are to be seen.

The soft palate runs downwards as well as backwards; and its posterior portion, as Prof. Flower specially pointed out to me, so closely embraces the base of the tongue that, except when in the act of swallowing, the epiglottis always projects quite into the posterior narial chamber, as in the horse and many other animals. The anterior portion of the soft palate is $\frac{3}{4}$ inch thick, and very glandular. A collection of glands of considerable size on each side of the fauces are the only representatives of the tonsils.

The *salivary glands* present the usual characters. The *parotid* is much the largest. It weighs 1 lb. 1 oz., and is of an irregular semilunar shape, the concavity embracing the superior portion of the angle of the jaw; it is mostly situated between the body of the masseter and the posterior insertion of the sterno-mastoid muscle. It lies almost entirely below the level of the zygoma, sending up a small portion into the interval between it and the external auditory meatus. Its duct, which is 14 inches long, commences at the inferior angle of the gland, and, as in the Ungulata generally, runs round the lower margin of insertion of the masseter muscle, and up along its anterior border till it pierces the buccinator, to terminate by a simple orifice in the well-marked fossa between the cheek-pad described above and the superior gum, in a line with the interval between the first and second upper true molar teeth.

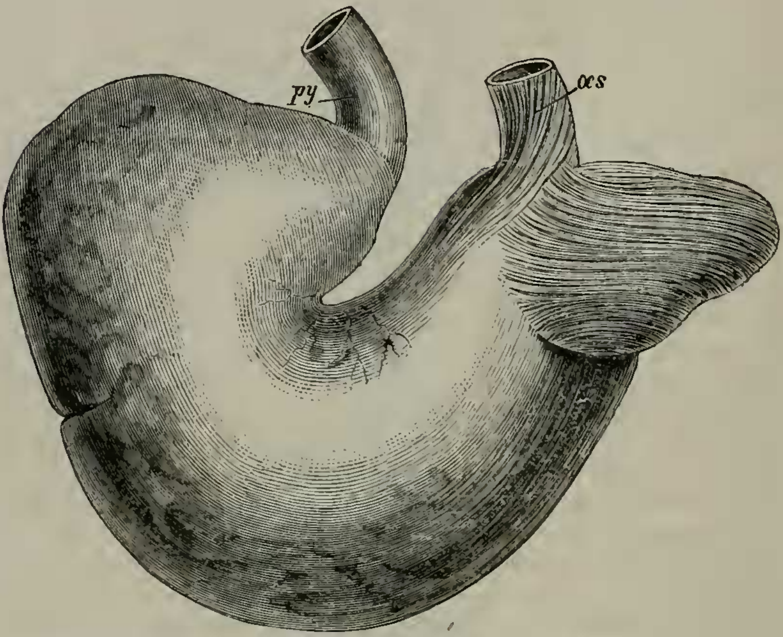
The *submaxillary* gland weighs $2\frac{1}{2}$ oz., and is irregularly cubical in shape. It is situated just under the angle of the jaw, covered by the digastric muscle. The duct is $13\frac{1}{2}$ inches long; anteriorly it is closely bound to the inner surface of the sublingual gland; and it opens far forwards, close to the frenum of the tongue, on either side of it.

The *sublingual* gland weighs 2 oz., and is composed of several small portions which open separately almost in one straight line, about half an inch apart, below the sides of the tongue, and parallel with the ramus of the jaw. The whole gland is about 6 inches long and 1 inch deep.

The *œsophagus* is thick and muscular, not of large calibre; it has the mucous membrane but loosely connected with the muscular parietes, and arranged in bold longitudinal folds.

The *stomach* is of a very different shape from that of the Indian Rhinoceros as figured and described by Prof. Owen, and in most respects resembles that of the horse. It forms a broad tube much bent upon itself, with the cardiac and pyloric orifices approximated, and a deep and narrow interval between them, in which the main vessels and nerves run, and across which the peritonæum extends. There is no definite constriction between the cardiac and pyloric portions of the viscus; but there is a peculiar diverticulum from the outer portion of the cardiac extremity, of a subconical form, in which the base of the cone is the attached end. The whole organ is therefore somewhat globose, with the above-mentioned cardiac cæcum projecting to the left side.

Fig. 2.

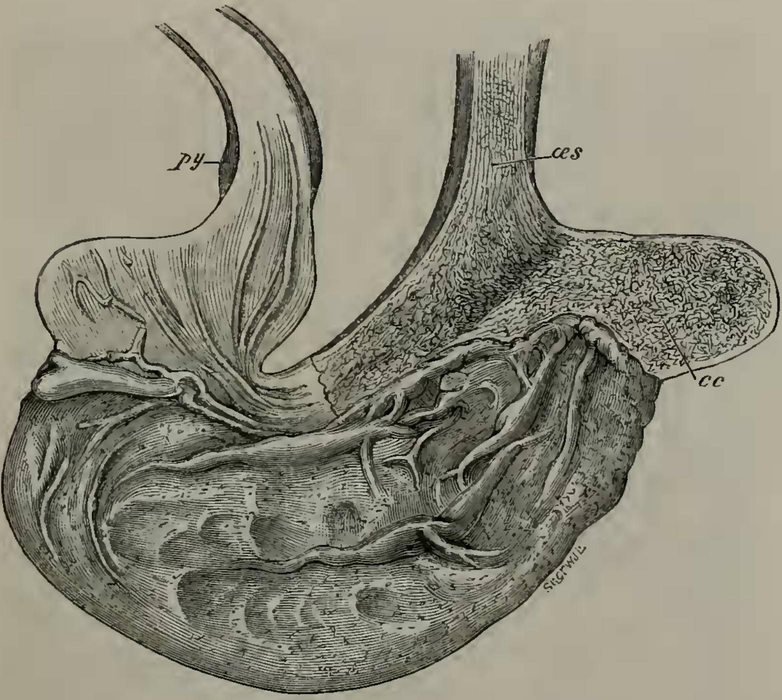


Stomach of *C. sumatrensis* (inferior or parietal surface).
œs, termination of œsophagus; *py*, commencing duodenum, just beyond pylorus.

With regard to the size of the stomach, the greater curvature is 62 inches in length, and the lesser 6 inches; the greatest breadth from side to side, including the cardiac diverticulum, is 26 inches; the greatest depth is 18 inches; and the length of the diverticulum is 11 inches, while it is $5\frac{1}{4}$ inches in diameter. The diameter of the undistended œsophagus where it enters the stomach is 2 inches, and of the commencing duodenum $1\frac{1}{2}$ inch. There is not a trace of enlargement of the duodenum at its pyloric end, like the considerable dilatation in the Indian species. A large portion of the pyloric portion of the stomach is situated beyond, or to the right of, the pylorus itself; but it is only a direct continuation of the cavity of the viscus, and hardly forms a true *cul-de-sac*. The great omentum, which does not cover the intestines, is of considerable size; it contains no fat, and is not in any way attached to the colon, but runs up, behind the stomach, free to the vertebral column.

The interior of the stomach presents a similar condition to that found in the Tapir and Horse, the mucous membrane being of entirely different characters in the cardiac and pyloric portions. That in the cardiac end, and in its diverticulum, is much plicated in all directions, and has a white opaque appearance; while the pyloric portion is covered with a thick and apparently smooth mucous membrane of the ordinary colour. The line of junction of these two portions is abrupt; and its position can be best understood from the accompanying drawing, in which it is seen that the corrugated white opaque epithelium only covers about one fourth of the whole cavity—namely, the margins of the œsophagus for about an inch, and the diverticulum, from which it extends to the right, and backwards for a short distance. The walls of the stomach are nearly uniform in thickness, being a little more muscular at the cardiac extremity and along the lesser curvature than elsewhere. When the organ is fully distended the diverticulum becomes less conspicuous, the direction of its superficial fibres being from its base to its apex. The pyloric muscular ring is strong and nearly an inch thick, projecting into the tube.

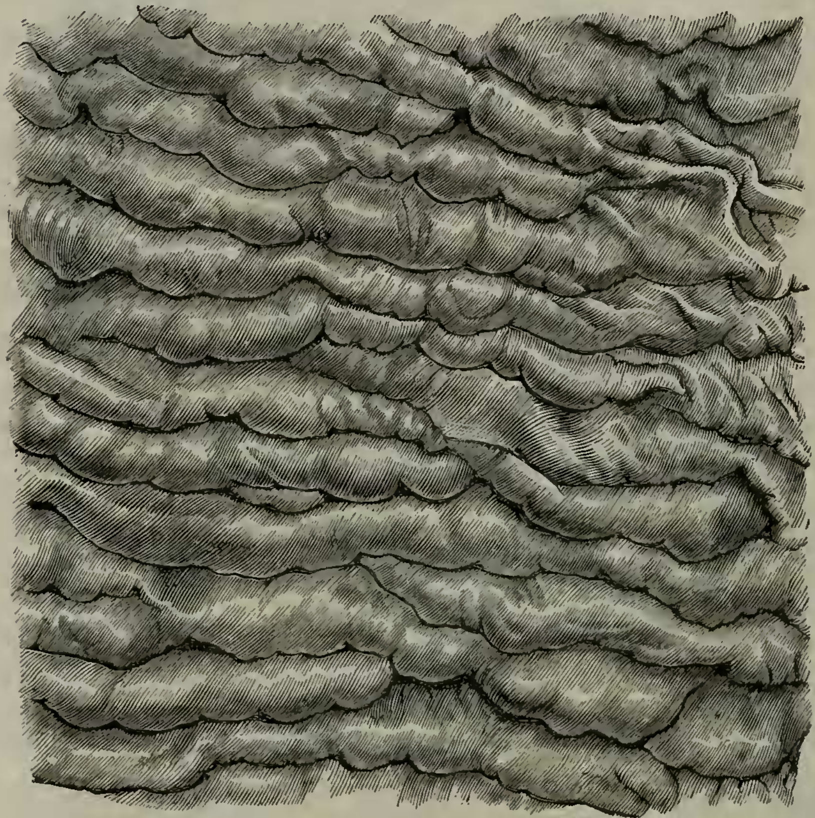
Fig. 3.



Stomach of *C. sumatrensis* (inner surface).
œs, œsophagus; *py*, pylorus; *cc*, cardiac cul-de-sac.

The small intestine is 36 ft. long, and of a nearly uniform circumference of 6 inches, reaching 7 inches in the duodenum. For the first six inches after the pylorus the mucous membrane is smooth and simple, much like that in the pyloric portion of the stomach. The seventh and eighth inches present irregular folds, which immediately give place to a perfectly uniform series of thin, continuous (or nearly continuous), transverse foldings, just like the valvulæ conniventes of the human small intestine. There are nineteen of these folds in each six inches of the intestine; and they continue unchanged to within half an inch of the ileo-cæcal valve, where they cease. Their great number (over 1300), extreme simplicity, and uniformity is very striking; they project nearly $\frac{1}{4}$ inch into the intestine. Many are continuous right round the tube; but where two approach one another, as is frequently the case, an intermediate one frequently ceases after having made nearly a complete circle. A few are to be seen extending for only about an inch; but most are either that size or considerably longer. There are no traces of any triangular or cylindrical papillæ throughout the whole length of the intestine.

Fig. 4.



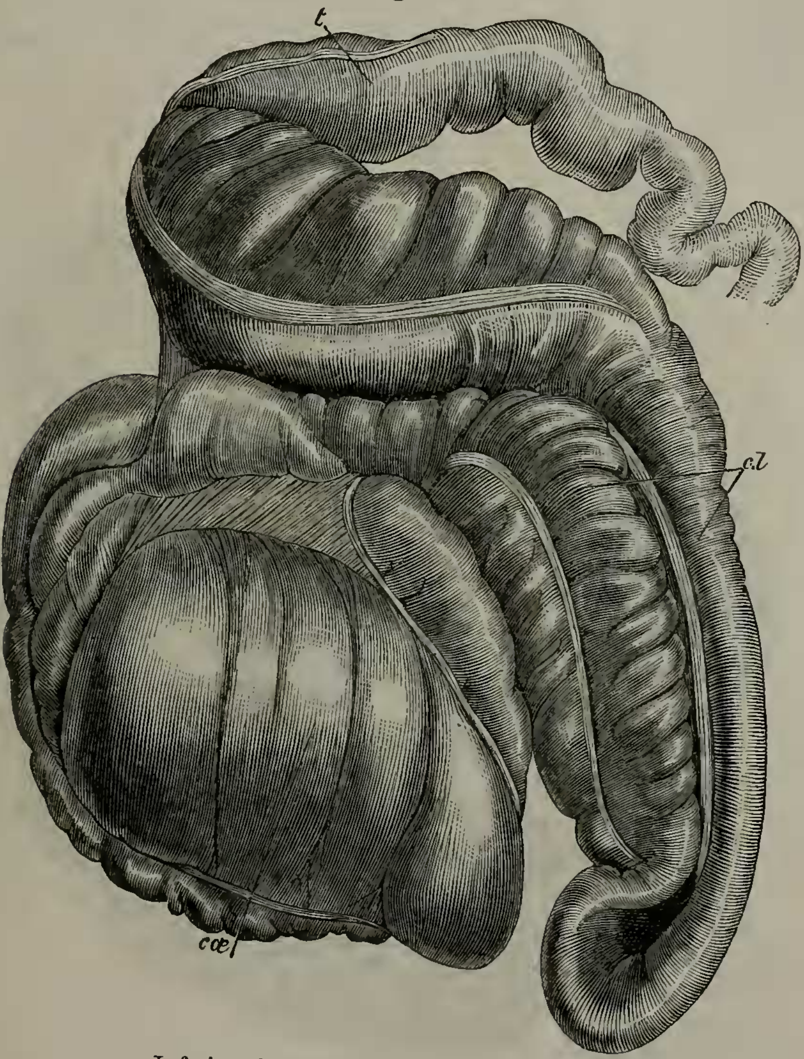
Mucus membrane of the small intestine, natural size, showing the valvulæ conniventes.

The bile and pancreatic ducts open on a papilla situated a foot from the pylorus, among the valvulæ conniventes, on the mesenteric border of the gut. This papilla is conical and rounded, projecting half an inch, with a single orifice at its apex. There is a second smaller orifice for a duct two inches further on, between two of the valvulæ and on one side of the main one.

No Peyer's patches could be found; and in their usual situation there was no irregularity of the valvulæ conniventes.

The ileo-cæcal valve does not project to any extent into the colon; but where the small intestine ceases, on the border of the ileo-cæcal orifice which is nearest the caput cæci, there are two closely approximated globose, apparently glandular masses, about the size of Tangerine oranges, situated in the walls of the intestine.

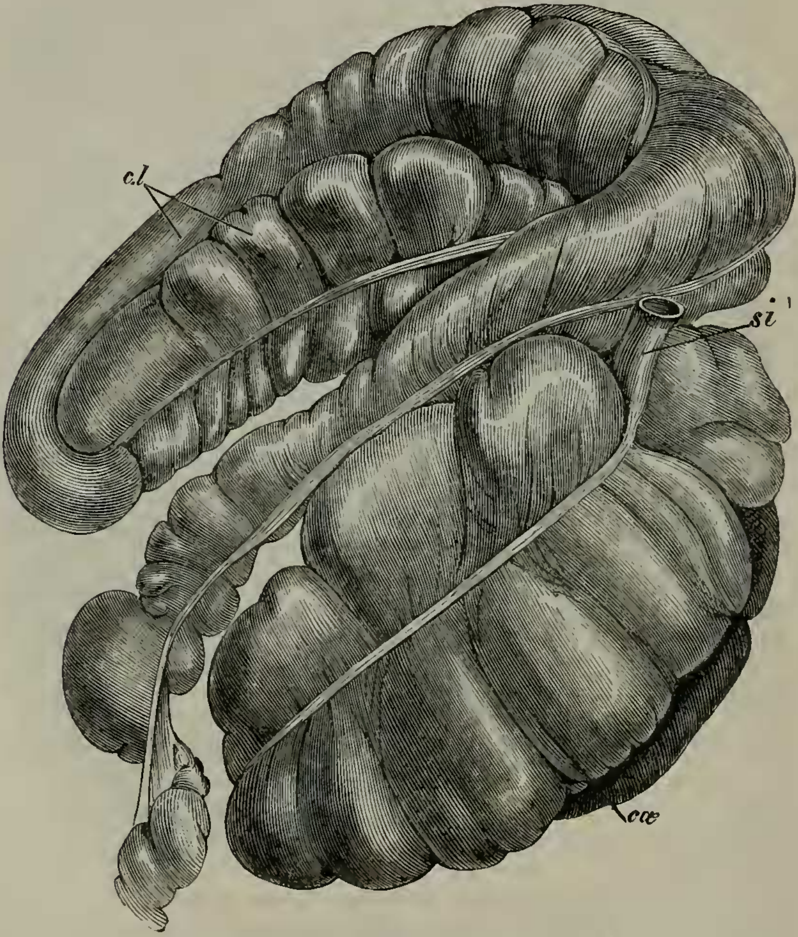
Fig. 5.



Inferior view of the colon of *C. sumatrensis.*
cæ, cæcum; *c.l*, colic loop; *t*, transverse colon, placed above the colic loop to show it more clearly.

The *colon* presents features of great interest, and agrees in its convolutions with the Indian Rhinoceros. When the abdomen is opened by a ventral longitudinal and transverse incision, the posterior portion, or the hypogastric region, is seen to be occupied entirely by a large, apparently globose viscus, which is the ventral wall of the cæcum: anteriorly to this, in the umbilical region, is seen a very capacious and sacculated tube, running nearly transversely and a little backwards as it tends to the left side; this is the posterior moiety of the enormous loop of the first part of the colon (ascending colon in man). Further forward, in the epigastric region, and somewhat covered by the ribs, is seen another transverse, but less considerable, sacculated tube, which is the anterior moiety of the same loop. There is no omentum covering these viscera. Nothing more can be seen without moving these parts.

Fig. 6.



Superior view of the colon of *C. sumatrensis*.
si, small intestine; *cæ*, cæcum; *c.l*, colic loop, with the transverse colon between it and the cæcum.

When the intestines are removed from the abdomen, the following disposition of the viscera is observed. From the huge subglobose cæcum, which is median in position, with its axis slightly obliquely backwards and to the left, the colon is directed forwards and to the right; but it almost immediately gives rise to the very considerable colic loop, which is directed first transversely to the left, and continues on obliquely backwards, the anterior returning portion of which returns to the right hypochondriac region, where its mesentery is very incomplete, and it is firmly bound down to the adjacent parietes. The transverse colon, running from this point, is situated quite above the colic loop, and is also bound down at the left hypochondrium as at the right. The third part of the colon (the descending in man) is very sinuous in its course; it ends by a very simple sigmoid flexure, and is continued on as the capacious rectum.

The *cæcum* is 3 feet long, and of nearly the same diameter; it is pyriform in shape, and much like that of the Tapir, the blind end being the narrower. It is traversed by three longitudinal bands, between which it is folded in large sacculi. The colon springs from the anterior end of the cæcum, and immediately makes a short sigmoid curve to the right. Its interior is lined with a smooth, simple, irregularly plicated epithelium, the folds of which are quite removed when the organ is distended.

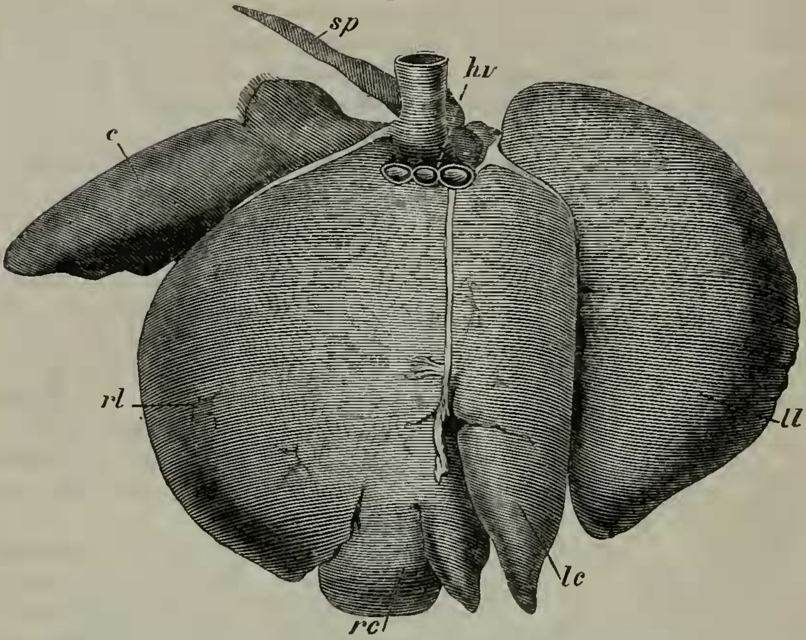
From the ileo-cæcal valve to the anus is 16 feet; and in its broadest part the colon is 39 inches in circumference. It is peculiar that, as in the Horse and also in the Tapir, the tube is of very different diameters in its different parts, the bend of the colic loop being very narrow in comparison with its main parts.

The proximal $\frac{7}{8}$ of the colic loop is sacculated, and, at its middle, 13 inches in diameter; but at its bend, where it is situated in the left iliac fossa, it is much smaller, being only $6\frac{1}{2}$ inches across, and not the least sacculated. It continues thus uniform on it surface, and gradually dilating for about $2\frac{1}{2}$ feet till in the epigastric region it again becomes sacculated and very capacious, reaching a diameter of $16\frac{1}{2}$ inches. From this point it rapidly reduces in the transverse colon, remaining somewhat sacculated, with only one longitudinal band, which is at the mesenteric border, till at the sigmoid flexure the diameter is $6\frac{1}{2}$ inches. The colic loop is just 5 feet long. There are no regular folds of the mucous membrane of the large intestine, but many minor ones, which disappear when the tube is distended. The rectum is nearly 7 inches in diameter.

This arrangement of the colon is different from that of the Horse in that the portion corresponding to the ascending colon is longer in the latter. In the Horse and Tapir the colic loop is formed from the transverse colon, in this Rhinoceros more from the right hypochondriac angle of that viscus. In the direction of the cæcum, namely backwards and to the left, the Rhinoceros agrees with the Tapir and differs entirely from the Horse.

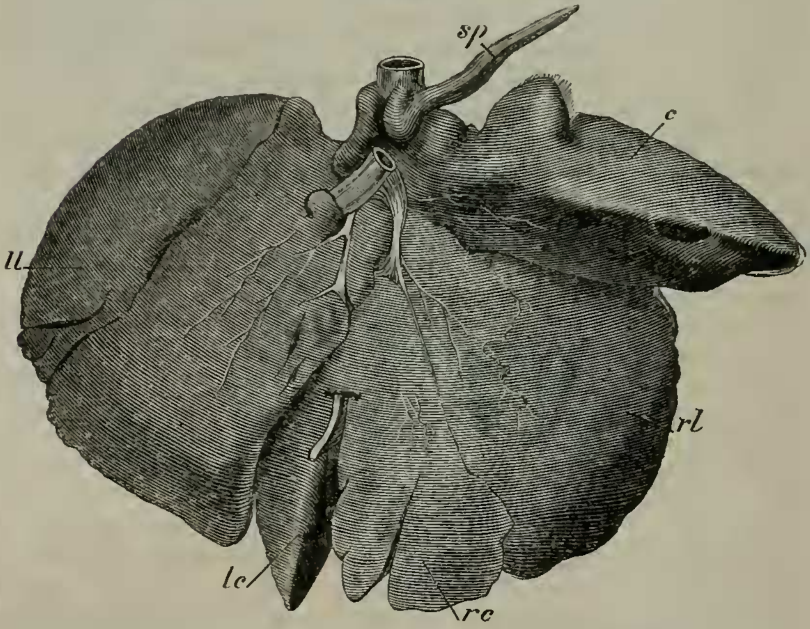
The *liver* is not large, considering the size of the animal. It weighs slightly over 15 lb., is flattened, and has no gall-bladder. Adopting Prof. Flower's method of describing this organ, all the main divisions are indicated, though most of the fissures are not deep. The left lateral lobe is the largest, and is overlapped by the left central along its median border. On the anterior surface

Fig. 7.



Anterior or diaphragmatic surface of liver of *C. sumatrensis*.
rc, right central lobe; *rl*, right lateral; *lc*, left central lobe; *ll*, left lateral; *c*, caudate lobe; *sp*, Spigelian lobe; *hv*, hepatic veins.

Fig. 8.



Posterior or abdominal surface of liver of *C. sumatrensis*.
rc, right central lobe; *rl*, right lateral; *lc*, left central lobe; *ll*, left lateral; *c*, caudate lobe; *sp*, Spigelian lobe.

the fissure between the two extends upwards to the left lateral suspensory ligament, and therefore nearly through its whole surface; posteriorly it only extends up about two thirds the distance. The median suture, between the left and right central lobes, extends halfway up the organ anteriorly, and not quite so far posteriorly, where it is stopped abruptly by a transverse bridge of hepatic tissue. The left central lobe is triangular, prismatic, and elongate, coming to a point below on a level with the general contour-line. One flat surface of this prism, the largest, is directed forwards; and the other two are wedged between the left lateral and right central lobes.

The right central lobe is less differentiated from the right lateral than those just described are from one another, the fissure only extending upwards a short distance; and it is itself cleft to nearly the same extent near the middle of its truncated inferior border. The right lateral, the lobe second in size, is suboval and simple, with the margin entire. Mesially it slightly overlaps the right central lobe at its inferior corner.

The caudate is a very considerable lobe, shaped much like the left central, but larger; it is elongate, ovate, prismatic, and pointed at its free end. The largest side is directed forwards; and the external margin of the right lateral overlaps it considerably. It is 15½ inches long, the whole liver, when lying on a flat slab, measuring 22 inches across, and 14 inches from above downwards. In no part does it measure more than 3½ inches from before backwards.

The Spigelian lobe is most peculiar, mainly consisting of a thin strip of hepatic tissue, 8 inches long, uniformly ¾ inch wide, and ¼ inch deep. At its attached end it becomes somewhat larger, and presents a free border superiorly for about an inch.

There are three large hepatic veins, which spring just above and behind this lobe, on their way to the vena cava.

The *pancreas* is irregular, not large nor concentrated.

The *spleen* is very thin and flat; it forms an elongated oblong, rounded at one end and squared at the other. Its length is 25 inches, and breadth 8 inches. It is slaty in colour, and weighs 2¾ lb.

The *kidneys* are flattened and oval in form. One is 6 inches broad by 9 inches long. They are nearly equal in size, and together weigh 10 lb. The hilum is linear, and on the inferior surface, not at the margin. They are lobulated externally, but not so much as in the Seals.

The *heart* presents no peculiar features. The whole organ weighs 10 lb. when emptied of clots. The annulus ovalis is well marked, and forms a considerable fold over the fossa ovalis. The commencing aorta, which is 4 inches long and 3½ inches across, divides into two nearly equal branches, one of which is continued on as the arch of the aorta, with a diameter of 1·85 inch; the other gives off the vessels to the head in the following manner. Immediately after the main division of the vessel into two parts, the innominate gives off the left subclavian, which, again, is much divided up. The innominate then, 3 inches above its origin, divides into the right subclavian and the common carotid trunk, which latter, after a simple course of 2½ inches, divides into the right and left common carotids. This disposition is very much like that of the Llama as drawn by Prof. Owen. The thickness of the ventricular septum is 1½ inch.

The *lungs* are extremely simple, coniform, and undivided, except at their apices, where, as in many animals, they send down small lobes which overlap the auricles of the heart. They are nearly equal in size, being 25 inches long by 15 deep and 5 broad. They weigh each 9½ lb. (uncongested).

The *uterus* is two-horned. The corpus uteri is 3½ inches long by 2½ inches broad; the cornua are 16½ inches, by 2 inches broad; they are both very distinctly longitudinally plicated. The os uteri is much folded, and the orifice is quite small; from it to the orifice of the urethra is 12 inches. The vagina is lined with a squamous epithelium, and it presents a few transverse folds about 3 inches apart. Its circumference in the middle is 15 inches, at its orifice 9 inches. The urethra is 2 inches long, and admits two fingers.

The length of the elongate fringed orifices of the Fallopian tubes is 5 inches.

The clitoris and vulva are similar to those of the Indian species.

3. On the Birth of a Sumatran Rhinoceros.

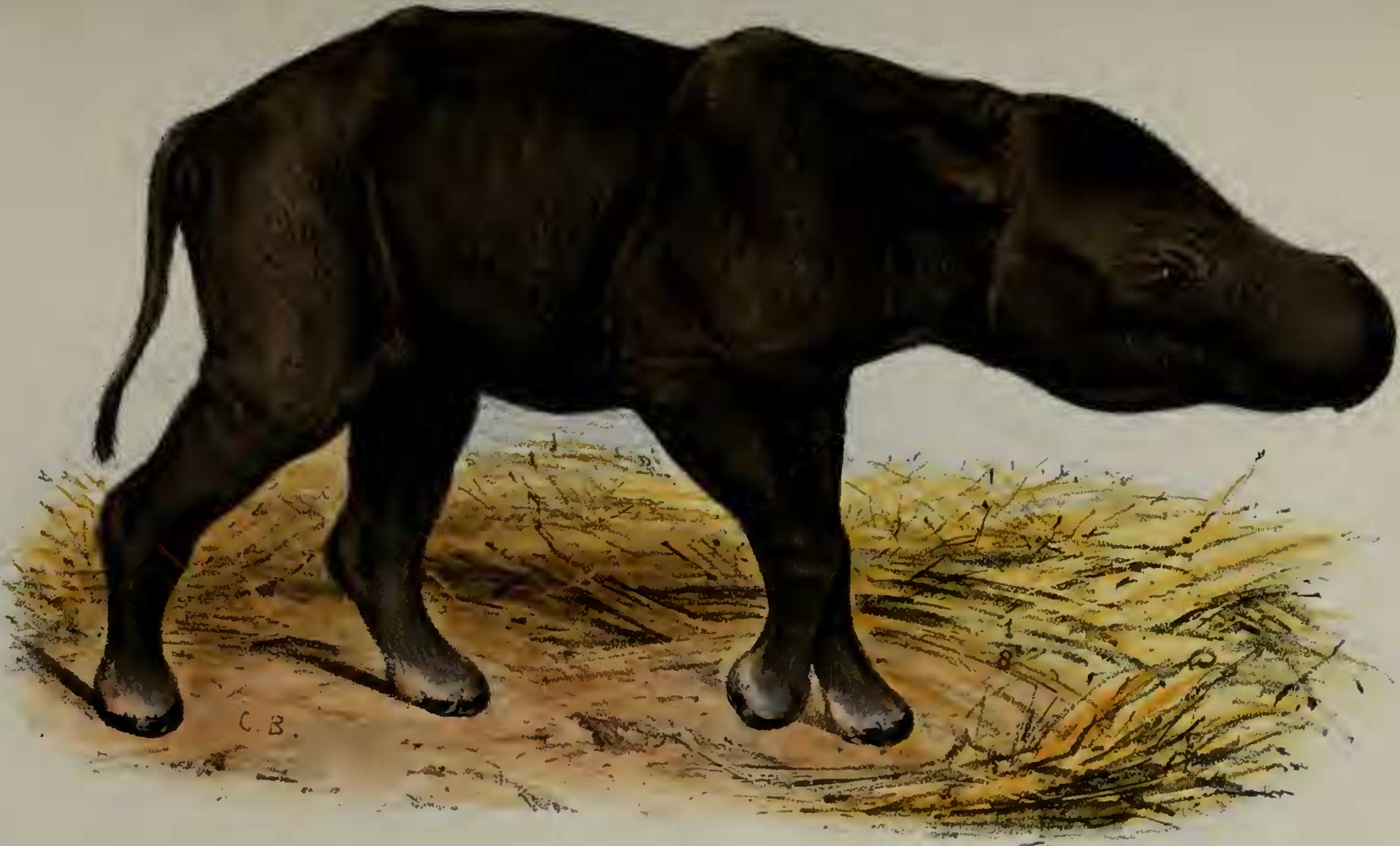
By A. D. Bartlett, Superintendent of the Society's Gardens.

[Received January 7, 1873.]

(Plate XI.)

The steamship 'Orchis' arrived at the Victoria Docks from Singapore on December 7, 1872, having on board an adult female Sumatran Rhinoceros (*Rhinoceros sumatrensis*). About 7 o'clock in the evening of that day the keeper was surprised to hear a feeble squeaking voice proceeding from the den containing the Rhinoceros. He was soon made aware of the cause of this small voice; for upon examining the den he found the beast had produced a young one, which was still fixed or attached by the umbilical cord; and while looking at it he distinctly saw the mother turn her head towards the young one and with her teeth bite or sever the connecting band. He found also that the mother, who had been always rather savage, appeared quite quiet and, as he called it, perfectly tamed; she allowed him to enter her den and milk her, and afterwards place the young one in a position that enabled it to suck. Having carefully closed the canvas all round and over the den, he left, thinking that rest and quietness would perhaps be desirable for the then tired and exhausted mother.

It appears, however, that the little Rhinoceros was not inclined to be shut up in the den, and was found soon afterwards walking about in the dark and rain on the deck of the ship. The cold and wet had produced the effect of almost depriving it of the use of its limbs; it was soon restored by being rubbed all over and placed in warm blankets. On the following morning I found the mother and young one on board the ship and about to be landed. I advised having the



C. Berjeau lith.

M&N. Hanhart imp.

RHINOCEROS SUMATRENSIS *vrt*

7
NATUR

little one removed from the den, fearing that, during the lifting and moving to the van or trolley, she might be thrown or tumbled on to the little one and crush it. No sooner, however, was the den safely landed on the carriage, than she exhibited signs of restlessness, and it was thought desirable that the young one should be replaced with its mother; this was done, and the keeper, Mr. Auguste Engelecke, entered the den and remained with the animals during the journey from the tidal basin of the Victoria Docks to the Commercial Road.

On arriving at the stables of Mr. Rice in the Commercial Road it required some time to unload the large den from the trolley and get it into the stable; and in order to prevent accident to the young one we again removed it from its mother and conveyed it at once into the house, taking it in blankets into the parlour, where there was a good fire. Here we had quite enough to do to keep it from running all over the room, so strong and determined it appeared to be. As soon as the mother was safely lodged in the stable, the little one was carried in a blanket by two men and placed with its mother, and immediately went to her and commenced sucking. A very remarkable circumstance connected with the mother was her unexpected quietness; for she had, previously to the birth of the young one, been inclined to attack the keeper or any one who went near her; but after the young one was born, she allowed the keeper to enter the den and milk her as quietly as the tamest cow; and moreover, after she was in the stable, I and the rest were inside with her and the young one, patting and caressing her with our hands as though she were a tame old pet that had been used to receive this marked attention from visitors. It has occurred to me since that she was probably in the sulks; for I remember the account of the Hairy-eared Rhinoceros when being removed in Calcutta: she turned sulky and lay down in the street, and it was with the greatest difficulty she was dragged or rather slid along over the muddy road to the stable; so stubborn and determined not to move was she that, although hundreds of pails of water were thrown over her, she would not rise. Was our animal now under consideration quiet by being under the influence of the sulks? I think this must have been the case; for she allowed the men to enter the den, and some were pushing at her nose, others pulling her ears to back her out, and all this was done without any attempt on her part to resent or injure her tormentors*. Now, believing the statement of Mr. Engelecke, this animal had been captured but little over seven months on her arrival in the docks; and Mr. Engelecke told me that her captors had witnessed the act of her copulation just before she was caught in the pitfall: we may presume, therefore, that the period of gestation does not differ much from that of the Hippopotamus.

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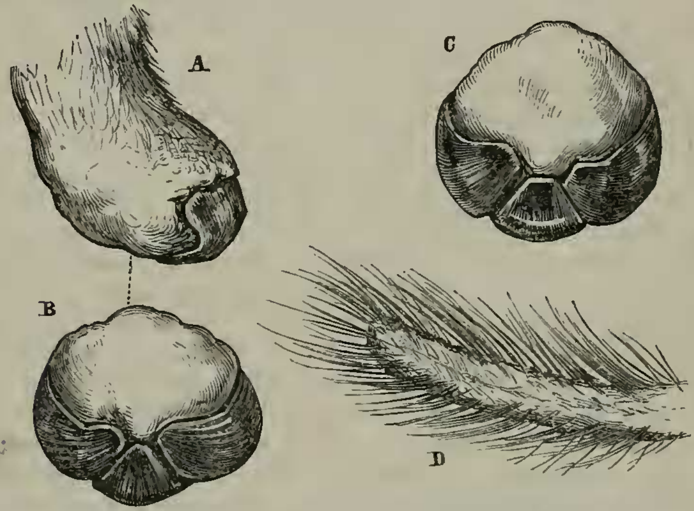
* Since the foregoing was written, my suspicion has been fully confirmed; for only a few days afterwards her savage disposition and temper caused Mr. Rice and his assistants the utmost alarm, lest she should escape from the stable or kill some of the men who attended to her; for she broke and smashed almost every thing within her reach, and they had the greatest difficulty in getting her into the den in which she was shipped to America.

In appearance the young Rhinoceros (see Plate XI.) reminds one of a young Ass, viewing its long legs and general mode of moving its large long head and meagre-looking body. The front horn on the nose is about $\frac{3}{4}$ of an inch high: the posterior horn is not developed; but a smooth spot indicates its position. Nearly black and covered with short crisp black hair, its ears very hairy inside as well as outside, the tail quite like a brush at the tip, it was thin and bony, looking much like a starved pig. One thing appeared to me remarkable—the condition of the hoofs; they were turned under the feet, as will be seen by the drawings (figs. A, B, C). The extreme points of the hoofs were quite soft, like the same parts of a newly born calf. It is quite evident, from the manner of the turning-under of these horny appendages, that, as they are worn through, the proper form is produced by the pointed portion being got rid of.



A. Side view and, B, sole of the right fore foot of the young Rhinoceros. C. Sole of right hind foot of same. These three figures show how the nails or hoofs are long and inturned immediately after birth, as described above. D. Sketch of the tail of the adult male.

It was 3 feet in length, 2 feet high at the shoulder; and its weight, as near as I was able to judge by lifting it, was rather over 50 lb.

I observed that as soon as the young one had sucked sufficiently it walked away from its mother and entered a dark corner in a box provided for it and lay down to sleep; by this I am led to think that in a wild state it would be left by the mother in the same way that many vegetable-eating animals leave their young while they roam about in search of food, returning to suckle their young at the proper time.

I have to express my regret at the death of this young animal, as by this misfortune we have lost the opportunity of noting the progress of growth, milk-dentition, and other facts connected with the history of the family. I learn also that the mother and the dead young one have been sent across the Atlantic.

4. On some new or imperfectly known Fishes of India and Burma. By Surgeon-Major Francis Day, Inspector General of Fisheries of India.

[Received November 25, 1872.]

Amongst the numerous species of fish which I have lately obtained at Bombay, Calcutta, or Kurrachee, the following appear to be undescribed or but little known.

Gobius masoni, sp. nov.

D. $6 \mid \frac{1}{11}$. P. 19. V. $\frac{1}{5}$. A. 10. C. 12. L. l. 34. L. tr. 11 *.

Length of head $\frac{1}{4}$, of caudal $\frac{1}{6}$, height of body $\frac{1}{5}$ of the total length. *Eyes*, diameter $\frac{2}{9}$ of the length of head, 1 diameter from the end of snout, and $\frac{1}{2}$ a diameter apart. Upper profile of the head rounded, its width equal to its height or to its length without the snout. No crest on the head, glands, or barbels. Cleft of mouth rather oblique, the lower jaw somewhat the longer; the posterior extremity of the maxilla extends to below the middle of the orbit. *Teeth*, a large recurved canine on the outer side of an enlarged row in the lower jaw. *Fins*: dorsal spines filiform, the longest two thirds as high as the body below it; second dorsal fin highest posteriorly, where it equals that of the body; anal similar to the second dorsal; caudal wedge-shaped; ventral not extending so far as the vent, its basal membrane well developed; none of the pectoral rays silk-like. *Scales* anterior to the middle of the first dorsal fin much smaller than those on the remainder of the body, which are ctenoid and in eleven rows between the base of the second dorsal and the anal fin; they are extended over the upper part of the cheeks and opercles. *Colours*: deep olive, with numerous small blue spots along the side, each in the centre of a single scale; an ill-defined dark band passes from the eye to the tail. First dorsal with its upper two thirds violet, tinged with yellow, its lower third deeply spotted with black; second dorsal with a violet and yellow margin, its lower three fourths spotted with black, most densely superiorly; anal dark, with a few small round white spots between some of the rays; caudal darkish with irregular blotches, and having its upper margin stained with yellow; ventrals nearly black, with an orange edging; pectoral without marks. Under surface of the throat black.

Hab. Bombay.

I have named this fish after my friend J. Wood Mason, Esq., of the Indian Museum, Calcutta.

Gobius ocellatus, sp. nov.

D. $6 \mid \frac{1}{10}$. P. 20. V. $\frac{1}{5}$. A. 10. C. 12. L. l. 32. L. tr. 8.

Length of head $\frac{2}{9}$, of caudal fin $\frac{1}{5}$, height of body $\frac{1}{7}$ of the total length. *Eyes* somewhat superior; diameter $\frac{1}{9}$ of length of head, $1\frac{1}{2}$ diameter apart and also from the end of the snout. Head slightly broader than high, its greatest width being equal to the postorbital portion of the head, the summit of which is somewhat flat and snake-shaped. No occipital crest, barbels, nor warts on the head. Cleft of the mouth somewhat oblique, the lower jaw slightly the longer; the posterior extremity of the maxilla extends to beneath the anterior margin of the orbit. *Teeth,* an enlarged outer row in the lower jaw, the external of which, on either side, is a moderately or small recurved canine. *Fins*: the distance of the first dorsal from the orbit equals the distance from the snout to the base of the pectoral fin, its second spine is elongated in some specimens, being nearly as long as the head; second dorsal and anal of about equal development and highest posteriorly; caudal wedge-shaped; ventral reaches halfway to the vent. *Scales,* ctenoid on the body, cycloid on the head; they are much smaller anterior to the dorsal fin than posterior to it; they cover the cheeks and opercles, and on the top of the head, as far as the snout, are in rather irregular rows, eight being between the origin of the second dorsal and the anal fin. *Colours*: olive, a dark green spot above the margin of the opercle; about six indistinct blotches along the sides; dorsal and caudal fins stained with dark, and having some indistinct spots or bars; a yellow ocellus at the top of the caudal fin, in its last half; anal whitish, its basal half covered with fine black dots.

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* By "L. tr." in the Gobies I signify the number of horizontal rows existing between the origin of the second dorsal and the anal fin.

Hab. Bombay, where it is not uncommon, attaining $5\frac{1}{2}$ inches in length.

GOBIUS BREVIROSTRIS, Günther.

I obtained at Kurrachee three specimens of this fish, up to $3\frac{3}{10}$ inches in length. A few rows of scales exist on the head in the larger, but none on the smaller specimens.

GOBIUS PLANIFRONS, sp. nov.

D. $6 \mid \frac{1}{10}$. P. 19. V. $\frac{1}{5}$. A. 10. L. l. ca. 46. L. tr. 15.

Length of head $\frac{2}{7}$, of caudal $\frac{2}{11}$, height of body $\frac{2}{11}$ of the total length. *Eyes* superior; diameter $\frac{1}{6}$ of length of head, 1 diameter from end of snout, and $1\frac{1}{2}$ apart. Head as broad at the opercles as its length excluding the snout; its height equals half its length; its upper surface flat. Mouth anterior, cleft horizontal, lower jaw the longer; width of gape equals half the length of the head; and the posterior extremity of the maxilla reaches to half a diameter behind the orbit. Fine tentacles near the nostrils, and rows of small warty glands on the scaleless head. *Teeth,* canines absent. *Fins*: first dorsal low, being about half as high as the body below it, the second fin higher than the first; silky pectoral rays; caudal rounded. *Scales* finely ctenoid, disposed in very irregular rows, none on the head; they merely reach on the nape halfway between the base of the first dorsal and the posterior edge of the orbit. Fifteen rows exist between the base of the second dorsal and the anal fin. *Colours*: dark olive, fins very dark grey; second dorsal spotted; a black blotch at the upper part of the base of the pectoral fin.

Hab. Bombay, where one specimen, 4 inches long, was obtained.

EUCTENOGOBIUS* CRISTATUS, sp. nov.

D. 6/14. P. 21. V. $\frac{1}{4}$. A. 14. C. 14. L. l. 48. L. tr. 11.

Length of head $\frac{2}{11}$, of caudal $\frac{1}{4}$, height of body $\frac{1}{6}$ of the total length. *Eyes* rather superior, close together, with the interorbital space concave; diameter $\frac{1}{4}$ length of head, 1 diameter from end of snout. Head and body compressed, the width of the former opposite the opercles equalling its length from the middle of the eye. No barbels or tentacles above the orbit; several very fine rows of warts on the cheeks; a low black-stained crest extending from the nape to the base of the first dorsal fin. Cleft of mouth very oblique, extending to below the middle of the orbit. *Teeth* in a single, conical, and fixed row in the upper jaw, in two rather widely separated rows in the lower, the anterior horizontal; no canines. Inferior pharyngeal bones in close juxtaposition along the median line, the two having a T shape and a single row of teeth. *Fins*: all rays in the dorsal flexible and a little elongated; the rays in the second dorsal increase in length to the last; anal similar; caudal pointed and elongate; ventrals reach vent. *Scales* cycloid, none on the head or along the sides of the raised crest; 11 rows between the origin of the second dorsal and anal. *Colours*: olivaceous, a dark spot under the eye; a dark ocellus, surrounded by a brown edge, at the base of the pectoral fin; numerous small black spots along the upper third of the body, and six or eight badly defined blotches along the side. Lower half of first dorsal reddish orange, with a narrow yellow longitudinal band above it, the upper half of the fin barred with black, an ill-defined violet-coloured ocellus on the last dorsal ray, which is edged with canary-yellow. Ventral and anal dark grey; caudal yellowish red, spotted in its upper half. Females not so bright as the males, and dorsal spines a little shorter.

Hab. Bombay. Numerous up to 5 inches.

They were breeding in March. It is also found in Madras.

APOCRYPTES MADURENSIS, ? Bleeker.

D. 6/24. P. 19. V. $\frac{1}{5}$. A. 23. C. 12. L. l. 53.

Length of head $\frac{2}{9}$, of caudal $\frac{1}{5}$, height of body $\frac{1}{7}$ of the total length. *Eyes*, diameter $\frac{1}{5}$ of length of head, 1 diameter from end of snout, and $\frac{1}{2}$ a diameter apart. Jaws rounded anteriorly, the cleft extending 1 diameter behind the orbit; width of head rather above $\frac{1}{2}$ its length. *Teeth* twenty-five, bilobate ones on either side of the lower jaw, a pair of fine canines near the symphysis; those in upper jaw conical, wider apart than those in the mandibles, but about the same number. *Fins*: caudal pointed; pectoral pointed, as long as the head without the snout, and extending beyond the end of the ventral, which last has a well-developed basal membrane and reaches halfway to the origin of the anal. First dorsal spines rather filiform, the longest slightly above half the height of the body below it. *Colours*: olive-brown, upper third of first dorsal between the second and fourth spines with a dark mark; anal black; pectoral nearly black, with a white lower margin; caudal dark, with a white lower edge; ventrals white. *Scales* irregularly arranged, minute anteriorly, becoming larger posteriorly; they cover the head.

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* This fish has cycloid scales; however, as some Gobies have ctenoid and some cycloid ones, I have not considered this a reason against its being placed in this genus. In my "Fishes of the Andaman Islands," Proc. Zool. Soc. 1870, p. 693, I erroneously wrote *Euctenogobius andamanensis* instead of *Apocryptes andamanensis*.

Hab. Madras, Bombay, and Kurrachee. Dr. Bleeker gives L. l. 35; but the species otherwise appears to agree pretty well.

AMBLYOPUS BUCHANANI, sp. nov.

D. 6/42. P. 19. A. 36. C. 17.

Length of head $\frac{1}{7}$, of caudal $\frac{1}{8}$, of pectoral $\frac{1}{25}$, height of body $\frac{1}{14}$ of the total length. *Eyes* distinct; the posterior nostrils open just in front of them, whilst the anterior are tubular and on the snout. *Barbels*, one short pair are placed behind the symphysis of the lower jaw, and a second, which are smaller, further back. *Teeth*, eight, long, widely separated ones in either jaw. *Fins*: the vertical ones continuous, their posterior portions enveloped in skin; caudal elongate and pointed; pectoral half as long as the ventral, and $\frac{2}{7}$ as long as the head. *Air-vessel* large and oval. *Scales*, a few crypts containing some exist in the posterior part of the body. *Colours*: brownish olive above, reddish below; pectoral and ventral fins black in their outer halves.

Hab. Calcutta, to 11 inches in length; its short pectoral and the presence of barbels would at once serve to show its distinctness from Hamilton Buchanan's figured *Gobioides rubicundus*, pl. 5. f. 9.

BLENNIUS STEINDACHNERI, sp. nov.

D. $\frac{11}{15}$. P. 15. V. $\frac{1}{2}$. A. 2+16.

Length of head $\frac{2}{9}$, of caudal $\frac{1}{6}$, height of body $\frac{2}{9}$ of the total length. Snout obtuse. Mouth moderately wide. A small orbital fringed tentacle about half the diameter of the eye in length; another short one at the anterior nostril. A line of about eight fringed tentacles from just behind the eyes to the base of the dorsal fin. *Teeth* fixed; no canines. *Fins*: dorsal not notched, neither is it continuous with the caudal; ventrals short; pectoral nearly reaches the vent. *Colours* light olive, with six indistinct brownish vertical bands, as wide as the ground-colour, and commencing at the base of the dorsal fin. The whole of the body and fins spotted with black. A large black white-edged ocellus between the first and second dorsal rays; some vertical red bands on pectoral and caudal fins; anal black-edged, having an external white margin.

Hab. Kurrachee in Sind, to 4 inches in length.

SALARIAS UNICOLOR, Rüppell.

D. $\frac{12}{17\text{–}18}$. P. 14. V. 2. A. 18–19. C. 10.

Length of head $\frac{2}{11}$ to $\frac{1}{5}$, of caudal $\frac{1}{6}$ to $\frac{1}{7}$, height of body $\frac{2}{11}$ to $\frac{1}{5}$ of the total length. *Eyes* prominent, 2 diameters from end of snout, interorbital space concave. The forehead does not project beyond the mouth. *In the male* a well-developed crest on the occiput, and a fringed tentacle above the orbit twice as long as the eye; another short one at the anterior nostril. *In the female* no crest on the neck, a fringed tentacle about as long as the eye above the orbit, and another short one at the anterior nostril. *Teeth*, canines absent. *Fins*: the anterior portion of the dorsal fin much lower than the posterior, the two parts being divided by a deep notch; this fin is not continuous with the caudal, which last is cut square. All the fin-rays simple, except those in the caudal. *Colours: in the male*, olive-brown with indistinct blackish blotches along the side and extending on to the dorsal fin; two or three rows of round blue spots on the body and head: *in the female*, olive-brown becoming white below, and marbled all over with brown lines, forming large insulated places. Head and upper two thirds of the body dotted with light blue; fins yellowish, dorsal and anal horizontally and sinuously banded in spots; caudal with five or six vertical dark bands. A brown band divided by a light blue line at the base of the pectoral, which is yellowish and barred with brown.

Hab. Kurrachee. Many specimens taken at the oyster-rocks, the males up to $5\frac{1}{2}$, females to $4\frac{1}{2}$ inches in length.

Although this species is not of a uniform brown colour, it appears to agree with the original specimens, which were evidently females.

SALARIAS LINEATUS, Cuv. & Val.

I have recently obtained two fine female specimens of this species, with the following fin-rays:—

in one, D. $\frac{12}{23}$. A. 25;
in the other, D. $\frac{12}{21}$. A. 23.

They agree in every respect with the male, except in not having any crest on the head.

Amongst the little-known Burmese Siluroids are the two following:—

MACRONES AFFINIS.

Batasio affinis, Blyth, Journ. As. Soc. Beng. 1860, p. 150.

D. $\frac{1}{7}\,|\,0$. P. $\frac{1}{7}$. V. 6. A. 12 $(\frac{3}{9})$. C. 17.

Length of head nearly $\frac{1}{5}$, of pectoral $\frac{1}{6}$, of caudal $\frac{1}{6}$, height of body $\frac{1}{5}$ of the total length. *Eyes*, diameter $\frac{2}{7}$ of length of head, 1 diameter from end of snout, $1\frac{1}{4}$ apart. Snout projecting. Longitudinal groove on the summit of the head indistinct, but extending to the base of the occipital process, which is narrow and has a separate interneural shield between it and the basal bone of the dorsal fin; it is twice as long as wide. *Barbels*: the maxillary, which are the longest, only reach to the anterior margin of the orbit. *Teeth* on the palate in an uninterrupted band. *Fins*: dorsal spine moderately strong, slightly serrated posteriorly in its upper fourth, and as long as from the hind edge of the orbit to the end of the snout; pectoral spine slightly longer and stronger than that of the dorsal, and coarsely serrated internally; adipose dorsal commences not far from the extremity of the first dorsal, and its base is a little longer than that of the anal; caudal forked, the lobes of nearly equal lengths. *Colours*: a dark spot on the shoulder, and a second on the base of the adipose dorsal fin; body with indistinct cross bands.

Hab. Tenasserim provinces.

One specimen (Blyth's typical one), $3\frac{1}{4}$ inches in length, is in the Calcutta Museum.

MACRONES LEUCOPHASIS.

Bagrus leucophasis, Blyth, J. A. S. of Beng. 1860, p. 148.

D. $\frac{1}{7}\,|\,0$. P. $\frac{1}{8\text{–}10}$. V. 6. A. $\frac{3}{8}$. C. 17.

Length of head $\frac{2}{9}$, of pectoral $\frac{1}{6}$, of caudal $\frac{2}{7}$, height of body $\frac{2}{9}$, of dorsal fin $\frac{1}{4}$ of the total length. *Eyes*, diameter $\frac{1}{4}$ of length of head, $1\frac{1}{2}$ diameter from end of snout, and 1 apart. Head somewhat compressed, snout rounded, the upper jaw slightly the longer. The superior longitudinal groove on the upper surface of the head does not quite reach the base of the occipital process, which last is twice as long as wide at its base, while there is a short interspace between its termination and the basal bone of the dorsal fin. Upper surface of the head slightly rugose. *Barbels*: the nasal reach the anterior margin of the orbit, the maxillary the end of the anal fin, the external mandibular to the middle of the pectoral, and the internal to the gill-opening. *Teeth* in an uninterrupted crescentic band on the palate. *Fins*: dorsal spine moderately strong, as long as the head from the angle of the mouth, finely serrated posteriorly in its upper fourth; the adipose fin commences just behind the first dorsal, and the length of its base is nearly double that of the rayed fin; pectoral spine much stronger than the dorsal, of about equal length, whilst it is coarsely serrated internally. The ventral arises behind the posterior extremity of the dorsal; caudal deeply forked, the lobes having filamentous prolongations. *Colours*: of a deep purplish black over the body and fins; numerous white dots exist on the body, most apparent after death.

Hab. Burmese rivers, attaining 12 inches or more in length. Its native name signifies "topsy turvy," as it is said to swim with its abdomen uppermost.

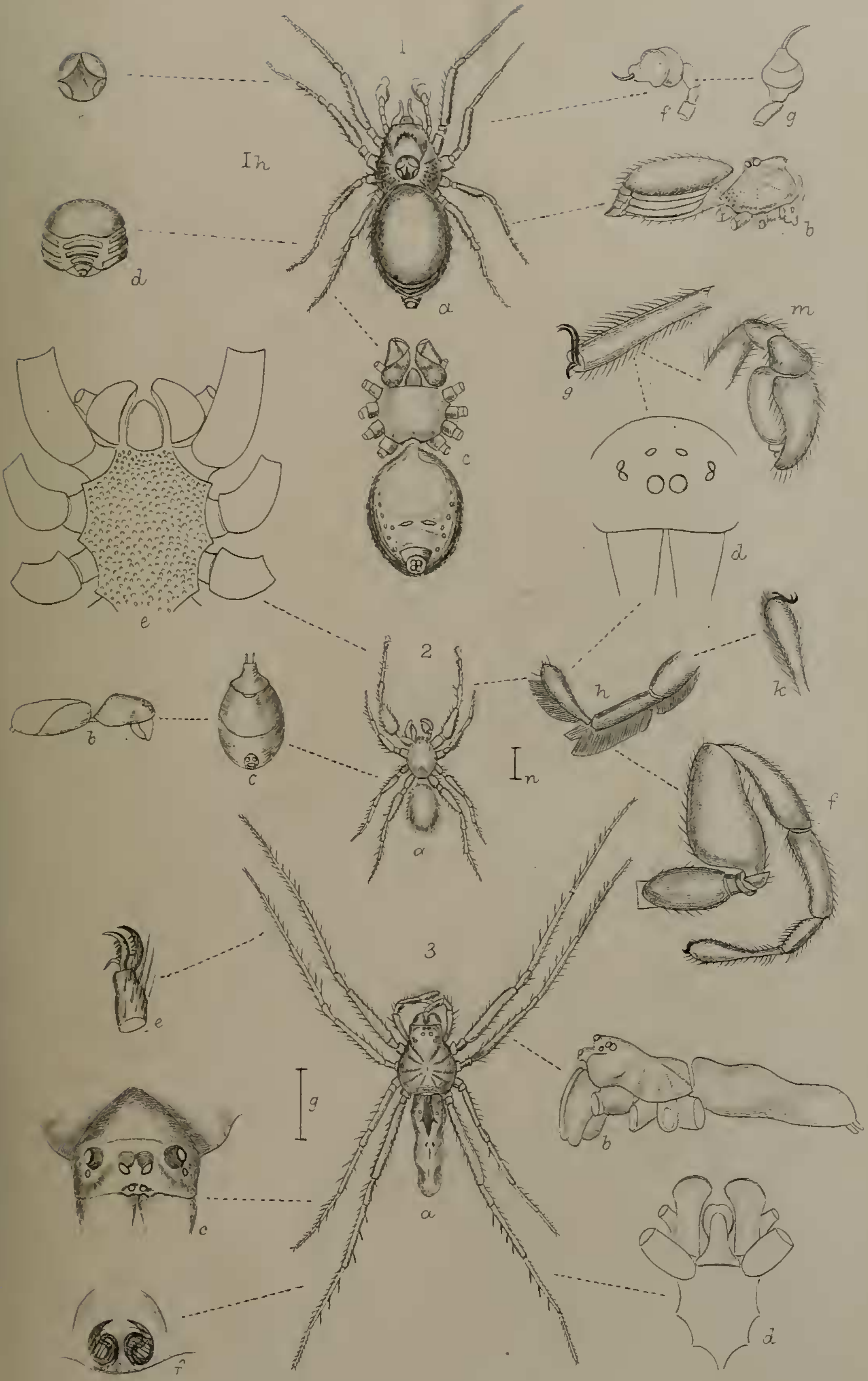
In the definition of the genus *Bregmaceros*, Thompson, the presence of an air-vessel and pyloric appendages has been denied; the former is, on the contrary, comparatively very large (in *B. atripinnis*, Day), whilst it has two pyloric appendages.

5. On some new Genera and Species of Araneidea. By the Rev. O. P. CAMBRIDGE, M.A., C.M.Z.S.

[Received December 2, 1872.]

(Plates XII.–XIV.)

The curious and minute Spiders described in the present paper are a strong disproof of an idea, very common among collectors, that



O. P. Cambridge del. A. T. H. lith.
W. West & Co. imp.

New Genera and Species of Araneidea

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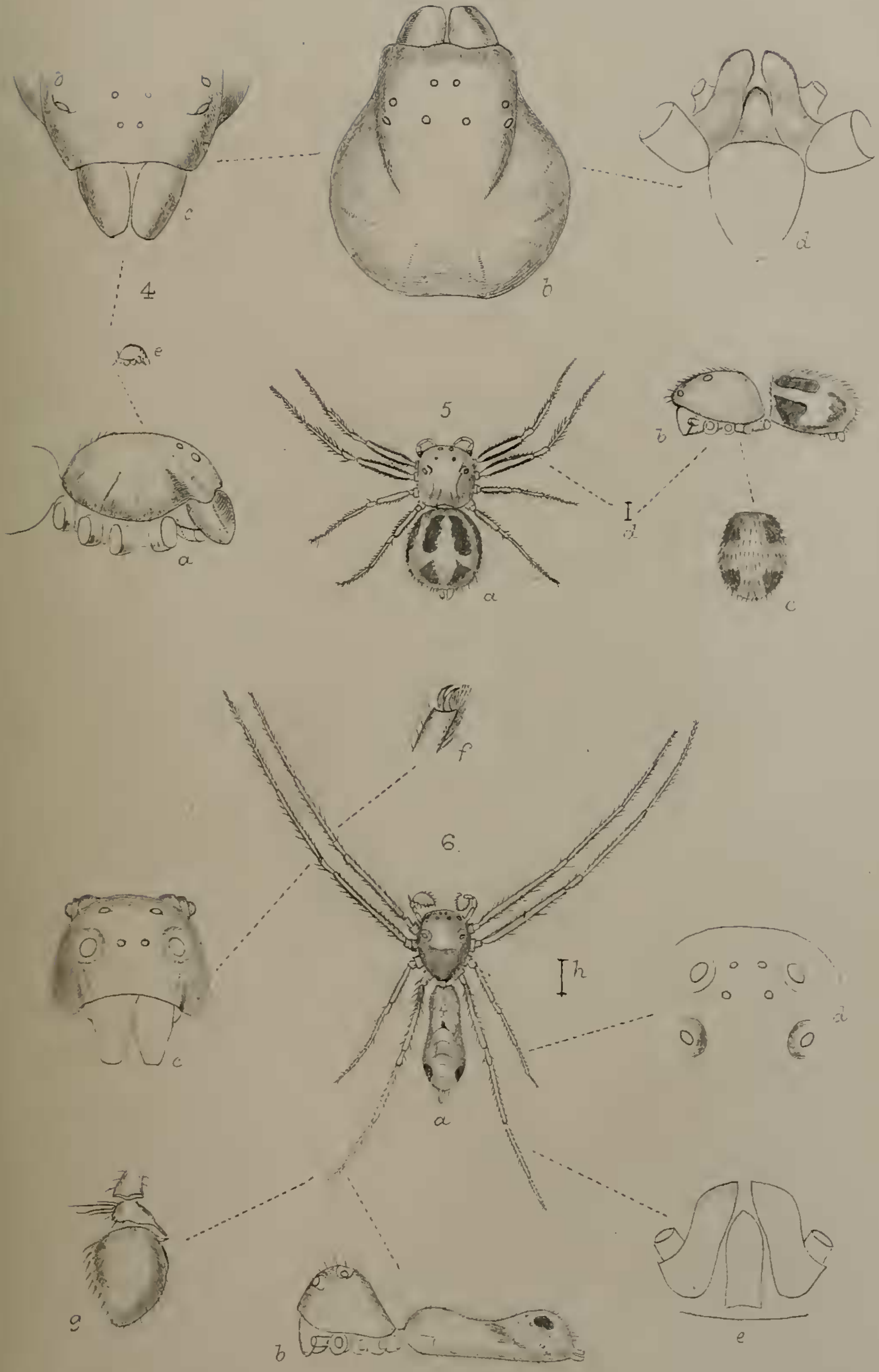
NATURAL HISTORY



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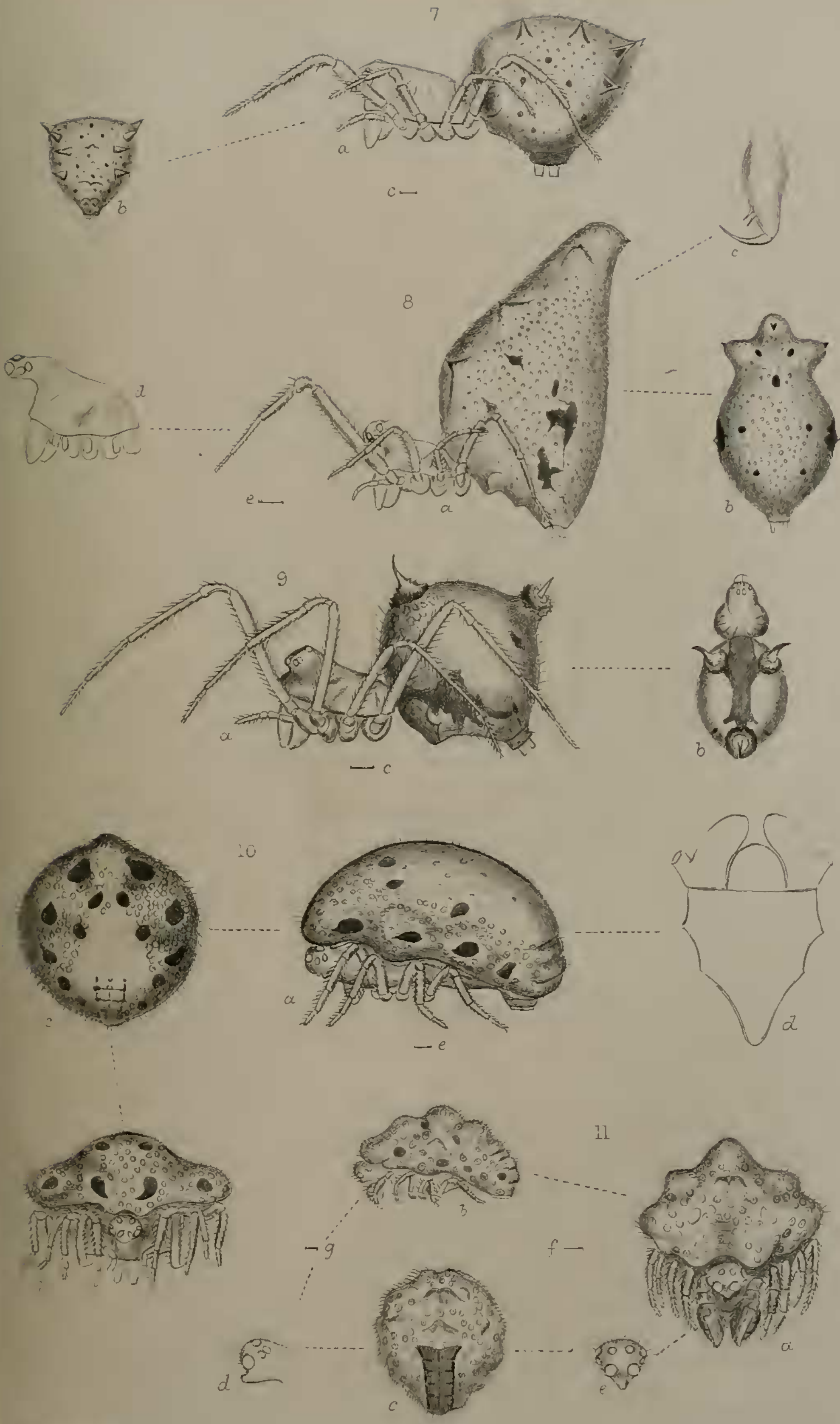

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L HIST

the *Micros* of the Exotic Articulata are less worth the trouble of collecting than the *Macros*. It arises, I suppose, chiefly from the comparatively unmarketable nature of the former; at any rate the consequence is that almost every collector crams his boxes or his bottles with the larger species, many of which we receive over and over again, *usque ad nauseam*, simply because they are large or brightly coloured. If one were to judge, in regard to Spiders, from the collections received from professional or regular collectors in tropical regions, it might be thought that there were there few or none of those very minute Spiders such as we find to be the staple of our temperate climates. In the collection, however, received from Ceylon, through the kindness of Mr. G. H. K. Thwaites, this idea is abundantly dispelled. *Hundreds*, I may say, of the species in these collections are exceedingly minute, and all of them of the greatest interest. Some of them, such as those here described, *Tetrablemma, Phoroncidia*, and *Stegosoma*, with others described in P. Z. S. Nov. 1870, are among the most remarkable forms known, while numerous others of equal interest yet remain to be described. The reason why Mr. Thwaites's collections are thus rich in the Micro-Araneæ is not (I feel sure) because Ceylon is more prolific than other tropical parts, but simply because the collections were made by "non-collectors." A "collector" turns over débris, or bark, or stones, or beats bushes and trees, and then picks and chooses according to what he thinks is most striking at the moment, or only what he believes to be different from what he has secured before, or perhaps what will sell best; and often (among Spiders) he sets down most of the small specimens as immature examples of larger ones; and thus while he is securing a few of the large and gaily coloured individuals, the thousand minute ones escape. The "non-collector," on the contrary, especially if he is a "native," secures every thing he can lay his fingers upon, regardless of form, size, or colour, or whether he has already obtained examples of the same or not. To this solely I attribute the richness of the collections received from Ceylon. They were made by one or two of the native workmen in the Royal Botanic Gardens during their leisure hours. These men appear to have followed implicitly the instructions impressed upon them by Mr. Thwaites, and to have bottled, mostly in the gardens themselves, every thing in the shape of a Spider that they could find. The consequence is that there are, as one might expect, numerous examples of some few common species; but at the same time there are numbers of minute rarities which we should never have got had not the collectors bottled, indiscriminately, every thing that their search laid bare. For discovering the articulated treasures of a tropical district, commend me to a few active and intelligent "natives," who will very soon produce the largest part of what the district holds; while a "collector," with a fancied (but often an imperfect) knowledge of species, picks and chooses, and lets go a hundred novelties while he is securing a few probably already well-known forms.

All, except two, of the Spiders described in the present paper are from Ceylon; of the others, one is from the Rio Grande in South America, and the locality of the other is unknown.

Further remark on these Spiders is here unnecessary, as the fullest possible details are given in the following descriptions.

Of one, however, *Tetrablemma*, it may be noticed as a striking fact that this, only the second four-eyed Spider known, should be so far removed from any recognizable affinity to the former one (*Miagrammopes*, Cambr., Journ. Linn. Soc. vol. x. p. 398, pl. 14). It is very difficult to assign with any confidence the systematic position of *Tetrablemma*. The situation as well as the number of the eyes is very remarkable—the former, I believe, without any parallel among Spiders, being placed contiguous to each other in a circular group, quite at the thoracic junction. While *Miagrammopes*, therefore, is unmistakably allied to *Mithras* and to the Epeïrides, *Tetrablemma* appears to come near to the Dysderides and Drassides, bearing at the same time some general resemblance to *Œcobius*: and it is between these groups that it is, provisionally at least, now placed.

Fam. TETRABLEMMIDES.

The position of the genus *Tetrablemma*, of which only at present this family consists, is, as before noticed, by no means certain; but its nearest affinities appear to be between the Œcobiides and Dysderides.

Nov. gen. TETRABLEMMA.

Cephalothorax broad, oval, rising above from all sides into a somewhat subconical form.

Eyes 4, large, but of unequal size, and closely grouped round a strongish circular eminence on the centre of the cephalothorax.

Legs short, moderately strong.

Maxillæ strong, greatly enlarged and rounded at their bases on the outer sides; extremities going off into a point on the inner sides, strongly inclined towards the labium.

Labium small, short, somewhat triangular; *sternum* large, truncate before, rounded behind.

Abdomen of regular oval form, covered with a corneous shield, furnished above the sides and hinder slope with longitudinal corneous folds; spiracular plates confluent and of large size, covering the larger portion of the underside, and followed by another subabdominal plate. *Spinners* 4, united in a cluster ensheathed in a corneous kind of envelope, and placed beneath the hinder extremity of the abdomen.

TETRABLEMMA MEDIOCULATUM, sp. nov. (Plate XII. fig. 1)

Male adult, length $\frac{3}{4}$ line.

This exceedingly curious Spider is of a nearly uniform bright reddish orange-brown colour; the form of the cephalothorax is very remarkable, looking like an inverted cullender, a little prominent near its apex in front. On the margin of this prominence are some small blunt black projecting corneous points, surmounted by a few hairs; the normal furrows are almost obsolete, so that the caput is scarcely traceable, though comprising the larger portion of the cephalothorax; the lower margin of the clypeus is prominent at the middle. Towards the margin of the thoracic portion are some raised points or granulations, the lateral margins of the caput being also set with a single line of small prominent points.

The *eyes* (four in number, pearly white and of large size) occupy the tubercular eminence which forms the apex of the cephalothorax; they are contiguous, and form a crescent whose open side is behind: the two foremost eyes are considerably the largest.

The *legs* are moderately strong, short, not very unequal in length, and furnished sparingly with hairs; their relative length appeared to be 1, 4, 2, 3. Terminal tarsal claws exist, but their number and exact construction could not be satisfactorily ascertained with the only optical instruments I possess.

The *palpi* are short; radial and cubital joints short, the former strongest; the digital joint is of a simple oval form, and appeared to have no concavity; palpal organs very large, simple, and of a somewhat irregular pyriform shape, with a longish strong curved black tapering sharp-pointed spine projecting from their extremity.

Falces moderately strong, of a somewhat conical form, pinched in at their extremities, which are furnished with a small curved fang; each falx has a long, nearly perpendicular and slightly curved projection at its base; this projection is equal in length to the rest of the falx.

Maxillæ, labium, and *sternum* (*vide* characters of the genus).

Abdomen rather large, and projecting considerably over the thorax; it is of a regular oval form, somewhat flattened above, where it is completely encased in a sort of corneous shield: the sides are steep and covered with three longitudinal corneous folds; these are separate from others, which are transverse on the hinder part, but follow the same linear direction as the lateral ones. The underside is two parts out of three covered by a larger corneous spiracular plate, near behind which the two apertures leading to the spiracles are visible; and behind them again is another oblong transverse plate of the same nature; near the lateral margins of these plates, and between them and the lower lateral corneous fold, is a single row of small rudimentary plates, looking like red-brown spots. The *spinners* are four in number, of equal length, and united in a kind of corneous case or sheath of a truncate-cone form, and placed under the end of the abdomen.

A single adult male of this most remarkable little Spider was contained in a collection of Arachnida received from Ceylon from Mr. J. H. K. Thwaites in 1871. I have not been able to ascertain any thing as to its habits or habitat.

Fam. PALPIMANIDES.

Nov. gen. PACHYPUS.

This genus is very nearly allied to *Otiothops* (Macleay, Ann. Nat. Hist., Sept. 1838, pl. ii. fig. 5); and but for the following differences I should have determined it, without hesitation, from its exceedingly similar general character and appearance, to have been identical with that remarkable genus.

Taking, then, the general characters of the two as very nearly similar, the distinctions between *Otiothops* (as described and figured by Macleay) and *Pachypus* are as follows:—

The *legs of the first pair* consist of the normal number (7) of joints, instead of 6, as in *Otiothops*; and these are furnished with terminal tarsal claws, whereas in *Otiothops* there are none on the legs of the first pair. The tarsal claws (of all the legs) are three, whereas those of *Otiothops*, on the legs of the three hinder pairs, are but two.

The *spinners* are two in number, while in *Otiothops* Macleay states them to be six.

The above differences show a nearer approach in some respects to *Palpimanus* (Duf.) than even to *Otiothops*; but although remarkably similar in colour, appearance, the form of the legs, and number of spinners, to *Palpimanus*, the position of the eyes is so strikingly dissimilar, as to make it impossible to include them in the same genus.

PACHYPUS MACLEAYI, sp. n. (Plate XII. fig. 2.)

Male adult, length 2 lines.

The cephalothorax is oval and has a smooth surface destitute of hairs, and almost equally convex on all parts of the upperside except behind, where it is a little higher (when looked at in profile) than in front; and the hind slope is rather abrupt; the normal furrows and indentations are obsolete, except a central longitudinal indentation on the hinder slope, indicating the thoracic junction; its colour is a deep but clear and bright red-brown; the surface smooth and destitute of hairs; and the height of the clypeus is nearly about half that of the facial space.

The *eyes* are unequal in size, and in four pairs or two transverse rows equal in their lengths and curves, which are directed from each other; those of the two central pairs form very nearly a square, the hind centrals being very small, and the fore centrals large, by far the largest of the eight; the former are considerably separated from each other, while the latter are nearly contiguous one to the other; those of each lateral pair are also contiguous to each other, and seated on a slight tubercle.

The *legs* are moderate in length—their relative length being 1, 4, 2, 3; and their colour is rather paler than that of the cephalothorax; those of the first pair have the basal (first) and third joints of remarkable strength; the point of junction between the second and third joints is of ordinary size, but the latter immediately thence enlarges above in an excessively protuberant form; a similar character is discernible in the corresponding portion of all the legs, but in a much less highly developed way. The genual joints (especially of the first pair) are long and enlarge gradually to their fore extremities; in the first pair of legs this joint slightly exceeds the tibial joint in length, and is also stronger. The metatarsus is but half the length of the tibia, while the tarsus is nearly double its length and clavate in form, the point of junction being very small; on the inner side of the tarsus and metatarsus and a portion of the tibia is a compact fringe of close-set hairs. The tarsi of all the legs terminate with three claws, the superior pair being slightly of an S form, the inferior one much smaller and sharply bent downwards; the tarsal claws of the first pair of legs are smaller than those of the rest, those of the fourth pair being the strongest and most conspicuous.

In the form of the legs consists one of the most conspicuous resemblances between *Otiothops* and *Palpimanus*; they are furnished only (and inconspicuously) with hairs.

The *palpi* are short and strong, similar to the legs in colour, and similarly furnished with hairs. The radial is stronger than the cubital joint, and is of a somewhat protuberant or tumid form on the upperside: the digital joint is long and of a somewhat tapering form; its length exceeds that of the radial and cubital joints together. The palpal organs are large and well-developed, but simple, consisting chiefly of a large and nearly globular corneous lobe with some small projections and spines at their fore extremity.

The *falces* are of moderate size, vertical, and subconical in form.

The *maxillæ* are strong, curved, inclined towards and over the labium, and considerably enlarged near the middle on their outer sides; the palpi are inserted low down and almost behind them (as looked at from the underside of the spider).

The *labium* is of a somewhat subtriangular form, its sides rather curvilinear, and its apex pointed.

The *sternum* is large and of an elongate heart-shape; its surface is covered thickly with small punctuose marks. The falces, maxillæ, labium, and sternum are all nearly similar in colour to the cephalothorax, the sternum being perhaps a little darker than the rest.

The *abdomen* is of a short oval form, moderately convex above, blunter and slightly broader at the hinder than at the fore extremity; its colour on the sides and upperside is a deep chocolate-red-brown, minutely mottled with yellowish; the epidermis is of a somewhat coriaceous texture, and sparingly clothed with short fine hairs; when looked at from beneath, the pedicle which joins it to the thorax is of a shining corneous nature, of a deep red-brown colour, and continuous with the similarly coloured and united spiracular plates. Continuous with these and spreading upwards and forwards over the sides in an oblique direction, a considerable portion of the underside of the abdomen is of a coriaceous texture and of a shining yellowish red-brown colour; behind this, for a small space towards the spinners, the colour of the abdomen is pale yellowish. The spinners are two in number, very short, contiguous to each other, and of a pale whitish-yellow colour.

The adult female is rather larger than the male, but similar in colours and general characters; immature examples of both sexes were of a more or less pale orange-yellow colour on all the fore parts, the abdomen being whitish drab-yellow. Adults as well as immature examples of both sexes were received from Ceylon from Mr. Thwaites in 1871.

Fam. PODOPTHALMIDES.

Nov. gen. LABDACUS (nom. prop.).

Eyes 8, unequal in size; the four largest form a transverse curved row on the summit of the caput, the curve directed forwards: in front of and near to each of the lateral eyes of this row is another minute eye, much paler in colour and therefore less easy to be seen; and in front of the two central eyes is a much shorter transverse row of two eyes, near together and placed immediately on the lower margin of the clypeus.

Cephalothorax rather Thomisiform, broad, oval, truncated at both ends; caput elevated above thorax, and produced a little forwards; clypeus prominent.

Abdomen elongate, tapering a little towards the spinners, and constricted laterally at two points.

Legs long, tolerably strong, relative length 4, 1, 2, 3; terminal (or tarsal) claws 3.

Maxillæ strong, moderately long, broad, enlarged and rounded at their extremities, and straight.

Labium rather more than two thirds the length of the maxillæ, oblong in form, rounded at the apex, in the centre of which is a small notch, and with the upper half enlarged on all sides in a sort of mushroom shape; this character of labium is frequently seen in Spiders of the genus *Melanophora* (fam. Drassides).

LABDACUS MONASTOIDES, sp. n. (Plate XII. fig. 3.)

Female adult, length $4\frac{1}{2}$ lines.

This remarkable Spider bears great resemblance to Spiders of the genus *Monastes* (Lucas). It is of a uniform yellow colour, the sides of the abdomen (in the constricted parts chiefly) being suffused with brownish red.

The *cephalothorax* is broad, oval, truncate at either extremity, constricted laterally on the margins at the junction of the caput and thorax. Caput rather elevated; clypeus broad and prominent; normal grooves and indentations moderately strong.

Eyes 8 in number, and situated on black tubercles, in position as above described; the two central eyes of the hinder row, which embraces nearly the whole width of the caput, are nearer together than each is to the lateral on its side, and the space which separates them from each other is about equal to once and a half an eye's diameter; the interval between each of the fore centrals, which are much smaller, is about equal to two diameters, while the space between each of them and the hind central eye nearest to it is rather greater than that between the hind centrals; those of the hinder row are very nearly equal in size; the laterals of this row have a side aspect, and the tubercles on which they are placed are stronger than the rest.

Legs rather long, moderately strong; those of the first and fourth pairs do not differ much in length, the fourth being a little the longest; they are furnished with hairs and spines; of the latter two parallel longitudinal rows of long strong sessile ones occupy the undersides of the tibiæ and metatarsi, chiefly of the first two pairs; underneath the tibiæ and metatarsi of the fourth pair is a peculiar row of close-set spine-like bristles of uniform length. Each tarsus terminates with three curved claws, the superior ones much the strongest, and pectinated about the middle, the inferior claw simple and strongly bent downwards.

Palpi moderately long and strong, furnished with hairs and spiny bristles of considerable length, chiefly on the radial and digital joints, the latter also terminating with a curved claw.

Falces long and strong, profile-line rounded.

Maxillæ and *labium* (see characters of genus).

Sternum oval, pointed behind.

Abdomen elongate-oblong, rather broader before than behind, constricted laterally about the middle and again near the spinners; its colour is yellow, marked on the upperside, chiefly in the constrictions, with brownish red. An elongate somewhat diamond-shaped longitudinal marking, sharp-pointed at its hinder extremity and truncate before, occupies the central line of the fore half of the upperside; this marking is of a dull opaque yellowish brown colour; and from the slightly angular point on either of its sides is a short line directed backward on each side also; but nearer the fore extremity of the abdomen is a small punctured dot; and following the hinder point of the above marking and almost close to it are two small red-brown elongate dots in a transverse line; the upper surface is very sparingly clothed with short fine hairs; but underneath near the spinners are some long prominent slender ones.

Spinners 6 (?), prominent, but moderate in length and strength; those of the superior pair are two-jointed, those of the inferior pair rather shorter but stronger and one-jointed. Genital aperture duplex, and with a shining black margin; its form is peculiar (see fig. 3, *f*, Plate XII.).

A single adult female example of this Spider was found by Mr. William Rogers (son of Mr. Henry Rogers, of Freshwater, Isle of Wight) on the Rio Grande, Brazil, and was forwarded to me in August 1872. Although presenting a very Thomisiform appearance, it has evidently a closer affinity in some respects to the Lycosides, and in others to the Agelenides; its nearest congeneric allies are probably the curious genus *Podophthalma* (F. de B. Capello) and *Triclaria* (C. Koch); but the position of its eyes and other characters preclude its being included in either of those genera, with which, however, I think it must be united in the family Podopthalmides, already formed, in an MS. scheme, to receive Capello's genus.

Fam. THOMISIDES.

Genus THOMISUS (Bl.).

THOMISUS PROSPER, sp. n. (Plate XIII. fig. 4.)

Female adult, length 3½ lines.

The *cephalothorax* of this Spider is of a peculiar form; and its profile-line forms a strong and equal curve; when looked at from above, it is almost round except the fore part, where the clypeus juts forward in a broad and square form. Its colour is a deep brown, marked and mottled with yellowish and with a yellow margin, the caput being furnished with short erect bristly hairs; but the example was much damaged, so that little beyond the form and colour of the cephalothorax, and the position of the eyes, could be ascertained with certainty.

The *eyes* are very minute, forming two parallel curved rows, which occupy the whole width of the caput, those of the lateral pairs being the largest, the fore laterals largest of the eight, seated on a strong tubercle, and separated by a tolerable interval from the hind laterals; between the two lateral pairs and rather in front of their straight line the four central eyes form a small quadrangular figure, whose fore side is the shortest; the height of the clypeus is equal to the longitudinal diameter of the figure formed by these four small eyes. The *falces* are short, strong, rather projecting, and equal to the facial space in length.

The *legs* do not differ much in length, their relative length being apparently 2, 1, 4, 3, the difference between 2–1 and 4–3 being very slight.

The abdomen was too much damaged to enable any description to be given; but the peculiar form of the caput (*vide* Plate XIII. fig. 4 *a*, *b*, *c*, *e*) distinguishes it at once from any described species known to me. The labium appeared to be longer than broad, somewhat elongated and pointed at its apex. The figures given of the labium and maxillæ are, it is believed, tolerably correct. When the now numerous Spiders of the genus *Thomisus* (Bl.) are divided, this Spider will probably form one of the genus *Xysticus* (Koch). A single example is in the Hope Collection at the University Museum, Oxford; but its locality is unknown.

THOMISUS OPPORTUNUS, sp. n. (Plate XIII. fig. 5.)

Female adult, length $1\frac{1}{8}$ line.

The *cephalothorax* of this species is massive and nearly square, with the corners rounded off, very convex above, the sides nearly vertical, and the hind slope abrupt, giving it a very Salticiform appearance; its surface is glossy, and the normal grooves and indentations are quite obsolete; the colour is deep red chestnut-brown, darkest in front, owing to the eyes being seated on largish black spots, and it is sparingly furnished with a few short hairs; the height of the clypeus equals nearly about one third that of the facial space.

The *eyes* are unequal in size, and though preserving the Thomsiform position, yet occupy a larger space on the fore part of the caput than usual, the laterals being far more distant from each other than ordinarily; in fact they may be best described as in three transverse lines, 4, 2, 2.

The laterals of the first or foremost row (which consists of four eyes) are large, far the largest of the eight, and occupy the extreme fore corners of the upperside of the caput; the two centrals of this row are small and separated from each other by about an eye's diameter or rather more, and they are rather in advance of the straight line formed by the fore lateral eyes: behind the fore centrals, and forming with them a quadrangular figure whose hinder side is considerably longer than its fore side, are the two eyes which form the second row; these are exceedingly minute and very difficult to see even with a lens; and behind them are the two eyes forming the third line; these are rather nearer together than the fore laterals and considerably less in size than those, but a good deal larger than the rest; the length of the line which they form is more than double of that formed by each lateral pair; the two eyes of the second row are about equally distant from those of the first and third, and each of them forms the apex of an isosceles triangle with the base formed by the two lateral eyes nearest to them.

The *legs* are moderately long but rather slender; those of the first and second pairs are much longer than those of the third and fourth, the second being rather the longest, and the third rather the shortest. Their colour is pale yellow, the femora of the first two pairs being tinged with orange-brown, and having a broad longitudinal deep-reddish-brown stripe throughout their length both before and behind. They are furnished with hairs and longish slender spines; and each tarsus terminates with two claws. The *falces* are short, strong, vertical, and subconical in form, and rather darker in colour than the cephalothorax. The *palpi* are short, slender, and similar to the legs in colour. The *maxillæ* and *labium* do not differ in form from those of this genus in general; and their colour, with that of the sternum, is dark yellowish brown.

The *abdomen* is of a short oval form, very convex above, and rather broader behind than before, where it projects forwards just enough to fit on to and cover the hind slope of the cephalothorax. It is sparingly clothed with hairs; and its colour is palish yellow, marked on the upperside with four large black patches, which leave the yellow ground-colour in the form of a cross; the sides are also each marked with a strong black patch, each patch meeting the other across the underside of the abdomen a little way from the spinners; the black patches on the upperside vary in extent, in some examples being almost wholly confluent.

The adult male is rather less in size than the female; but the first and second pairs of legs are longer, and the femora are suffused with dark reddish yellow-brown, the tibiæ also being bright red-brown. The palpi are short, not strong, but of a dark reddish-brown colour, except the cubital joint, which is yellow; the radial joint is of the same length and strength as the cubital, being broadest in front, and having a not very large bluntish pointed apophysis from its extremity on the underside; the digital joint is oval, pointed at its extremity, not very large, but exceeding in length that of the radial and cubital together. The palpal organs are neither prominent nor complex, apparently consisting of a flattish round corneous lobe, with a pointed black spine issuing from near their inner extremity. The abdomen of the male has the upperside covered with a stoutish coriaceous shining shield clothed with a few small bristles, the sides and hinder part being longitudinally wrinkled ; but the pattern described from the female is visible on the upperside, though less distinctly, owing to the yellow ground-colour of the female being replaced in the male by a red-brown similar to that of the cephalothorax; the black patches (in the two males examined) are also of smaller extent, and occupy the four corners of the upperside, leaving a strong well-defined and almost regular Greek cross of a red-brown colour.

Four adult females and two males of this pretty species were contained in the Ceylon collection received from Mr. Thwaites in 1871.

Subfam. PHILODROMINÆ.

Nov. gen. AMYCLE (nom. propr.).

Cephalothorax short-oval, the hinder extremity the most pointed, very convex above, almost subconical, caput and thorax being confluent.

Abdomen elongate, broader behind than in front, and constricted across the middle, mostly on the sides and upperside.

Eyes eight, unequal in size, occupying a large area rather in front of the apex of caput and thorax, and forming two quadrangular figures, one within the other; the outer quadrangle greatly the largest, and formed by the four largest eyes, the inner one situated on the fore margin of the outer one.

Maxillæ long, slightly hollow both on the inner and outer margins (looked at from above with the Spider flat on its back), rather rounded and enlarged on the outer extremities, and inclined towards the labium.

Labium oblong, with the apex somewhat pointed.

Legs slender, apparently laterigrade, those of the first two pairs longer than those of the third and fourth, relative length 2, 1, 4, 3 ; terminal tarsal claws *two*.

AMYCLE FORTICEPS, sp. n. (Pl. XIII. fig. 6.)

Male adult, length $2\frac{1}{4}$ lines.

The *cephalothorax* of this odd and rather Salticiform-looking Spider has the appearance (when looked at in profile) of the hinder part having been trimmed off, the thoracic region being greatly curtailed, while the caput is exaggerated ; and the normal grooves and indentations are scarcely visible ; the height of the cephalothorax is more than two thirds of that of the length, its colour is orange-yellow ; and there are a few erect black bristles within the ocular area.

The *eyes* are on tubercles of a paler colour than the surrounding surface ; those of the outer (or largest) quadrangle are rather large, and the tubercles on which they are seated are much the strongest. This quadrangle is rather greater in its transverse than in its longitudinal diameter, and its fore side is rather shorter than its hinder one; on the whole it is not far short of being a square : the inner quadrangle (placed within the larger one) is small, and the four eyes forming it are minute; but its general proportions are not very different from those of the larger one ; its foremost pair of eyes are (when looked at from the front) a little above the straight line of those which form the front of the large quadrangle ; and these four eyes are about equally separated from each other. A great similarity may be observed in the position of the eyes of this Spider to those of Spiders of the genus *Eresus,* though there is no near affinity at all between them in other respects, belonging, indeed, as they do, to a widely distant family ; the height of the clypeus equals half that of the facial space.

The *legs* are long and slender, of an orange-yellow colour, except the tarsi, which, as well as the outer sides of the genual, tibial, and metatarsal joints, are of a whitish cream-colour; those of the second pair are a little longer than those of the first, and those of the third pair are much the shortest ; they are furnished sparingly with hairs and a very few fine spines ; each tarsus terminates with two curved pectinated claws, beneath which is a small scopula.

The *palpi* are short, and similar in colour to the legs : the radial and cubital joints are very short but of equal length ; the former is strongest and has a small pointed spine-like apophysis at its outer extremity ; the digital joint is large and of a flattish broad oval form pointed in front. The palpal organs are simple and encircled by a black filiform spine ; and another short one has its prominent point near the point of the radial apophysis.

Falces short, moderately strong, straight, and nearly vertical, and similar in colour to the cephalothorax.

The *maxillæ* and *labium* are of a rather paler hue.

Sternum heart-shaped and yellow.

The *abdomen* is double the length of the cephalothorax, and narrow, the hinder portion being the broadest and rather rounded ; the sides and middle of the upperside are shrunken in or constricted ; it is very sparingly clothed with hairs; and its colour is dull pale yellow obscurely marked with blackish brown on the fore part and sides, with some transverse slightly angular lines or narrow bars of the same colour across the hinder part of the upperside ; there are also some curved oblique rows of pale spots on the sides, formed by small tufts of pale hairs ; these are less conspicuous in the male than in the female. On either side of the hinder part of the abdomen near the spinners is a large round conspicuous black spot ; the spinners are six in number, rather large, not long, those of the inferior pair being the largest. The female is rather larger, but in colours and markings resembles the male.

Of this curious and anomalous-looking Thomisid, which might be easily mistaken at first sight for one of the Salticides, several examples (including both sexes) were received from Ceylon, from Mr. G. H. K. Thwaites.

Fam. THERIDIIDES.

Genus PHORONCIDIA (Westw.).

PHORONCIDIA THWAITESII.

Phoroncidia thwaitesii, Cambr. Journ. Linn. Soc. vol. x. p. 270, pl. 9. figs. 17–21.

Since the publication of the description and figures of the female of this Spider, I have received numerous examples of both sexes in the adult state from Ceylon, kindly sent me by Mr. Nietner, as well as by Mr. Thwaites.

The adult male resembles the female in general characters, colours, and markings, but is rather smaller; the caput is also rather more produced; and the abdominal spines are longer in proportion than those of the female, in fact exceeding in length that of the abdomen itself, and presenting a very formidable appearance, an absolute bar, one would imagine, to any chance of ever being swallowed by a bird. The palpi of the male are dark brownish black; the radial is rather longer and stronger than the cubital joint, and is broadest at its fore extremity, where it has a marginal row of bristly hairs; the digital joint is moderate in size, and of an oval shape; the palpal organs are well developed and encircled with a slender filiform spine.

PHORONCIDIA BREVISPINOSA, sp. n. (Plate XIV. fig. 7.)

Female adult, length 1 line.

This species nearly resembles *P. thwaitesii* (Cambr.) in its general form and in the number and position of the spines on the abdomen; but it may be distinguished easily by its smaller size, the shortness of the spines, and the less prominent ocular portion of the caput.

The *cephalothorax* is of a blackish-brown colour: the *legs* pale orange-yellow, short and rather strong, their relative length being 1, 4, 2, 3; the difference between 1 and 4 is very slight; and they are furnished sparingly with bristly hairs. The palpi are also short, similar in colour to the cephalothorax, and apparently without any terminal claw.

The *eyes* do not differ greatly in size; but their position is the same as that of *P. thwaitesii*, four centrals forming a square; and on either side the laterals are placed very obliquely, almost horizontally in fact, and forming with the fore centrals nearest to them a short curved row on each side.

The colour of the *falces*, *maxillæ*, and *labium* is dull yellowish brown, and that of the *sternum* nearly black.

The *abdomen* is of a dull orange-yellow colour, with a few small indistinct whitish patches; its surface is thinly but regularly, and (on the upperside at least) somewhat symmetrically, covered with round impressed dots or punctures; there are also a few small blackish spots on the upper part, hinder part, and sides; and the posterior spines are clouded with black.

The spines, nine in number, are very short, and, in fact, of a sharp conical form; but their position is exactly the same as in the spines before alluded to in *P. thwaitesii*.

A single adult female was received from Mr. Thwaites in 1871.

PHORONCIDIA SEPTEMACULEATA, sp. n. (Plate XIV. fig. 8.)

Female adult, length 1½ line.

The excessive elevation of the abdomen, whose height is double its length, will serve readily to distinguish this species, independently of the very different nature and the number of the spines:

these are seven in number, three on either side of the upper part of the abdomen, and one pointing backwards at its hinder extremity or summit; all of them are very short, in fact quite rudimentary, but each issuing from the summit of a somewhat coniform protuberance of the abdomen. When looked at in profile, the abdomen is of a somewhat subtriangular form, rather humped a little below the middle on its fore side.

The *cephalothorax* is of a dark blackish yellow-brown colour, the ocular portion strongly prominent, and its extreme point somewhat bent downwards; there is a greater inequality in the size of the eyes than in *P. brevispinosa*, those of the fore central pair being considerably the largest; but their general position is the same.

The *legs* are rather short, their relative length 4, 1, 2, 3; they are of a dull yellow colour and furnished with hairs and slender spine-like bristles. The *palpi* are very short, slender, and similar in colour to the legs.

The *falces*, *maxillæ*, and *labium* are paler in colour than the cephalothorax; the *sternum* is of a dull yellow tinged with orange, and its surface is covered with impressed dots or punctures.

The *abdomen* projects greatly over the base of the cephalothorax, and is of a straw-yellow colour; its surface is thickly covered with round impressed dots; and there are a few irregular patches of dark brown, mostly on the lower part of the sides; besides these there are seven somewhat round brownish-yellow ones on the fore (or upper) part, and also seven on the hinder side, all symmetrically arranged.

The adult male is much smaller than the female; its caput is more produced and prominent in the ocular portion; and there are a few conspicuous prominent spines on the upperside of the tibiæ of the first pair of legs; the spines on the abdomen are also of a rather more marked character, the protuberances of the abdomen from which they spring appearing to form part of the spine, more so at least than in the female. The palpi of the male are short; the radial joint is longer and stronger than the cubital, and of a somewhat subconical form, with a single row of bristles round the margin of its fore extremity, which is the broadest part of the joint; the digital joint is of moderate size, equalling in length both the radial and cubital joints together; the palpal organs are well developed, moderately complex, and are margined with a slender black filiform spine. The colours and markings of both sexes are very nearly similar, the male having some blackish yellow-brown markings (not observed in the female) near the lateral edges of the hinder part of the upperside.

The falces (in both male and female) have two sharp teeth contiguous to each other near their extremities on the inner side.

An adult male and an adult and immature female were received from Mr. Thwaites, from Ceylon, in 1871.

PHORONCIDIA TRISPINOSA, sp. n. (Plate XIV. fig. 9.)

Female adult, length 1½ line.

This Spider may easily be distinguished from either of the foregoing by the number of the spines; the ocular portion of the caput is also less prominent; and the epidermis of the abdomen is of a less coriaceous nature. The cephalothorax, falces, maxillæ, and labium are of a deep yellow-brown colour, the sternum being rather darker.

The *eyes* are in the usual relative position, though the laterals are rather further removed on either side from the four central eyes.

The *legs* are moderately long, not very strong, furnished with hairs, and some fine longish erect slender spine-like bristles of different lengths along their uppersides.

The *palpi* are short, slender, and, with the legs, of a somewhat dull orange-yellow colour.

The *abdomen*, when looked at from above, is of a short oval form, but, from its great convexity, nearly globular in appearance when viewed laterally; it is of a dull whitish-yellow colour, marked in several places with irregular groups of cretaceous white spots. A broad deep-brown band runs longitudinally along the centre of the upperside; and at either of its fore corners is a round, roughened, tuberculous, dark yellow-brown boss prolonged into a strongish curved spine. At the middle of the hinder extremity of the abdomen is another boss of a similar nature, but rounder and more prominent; from the centre of the extremity of this boss springs a vertical tapering pointed straight spine, but not nearly so long nor so strong as the two at the fore extremity: the surface of the abdomen, as well as the small prominences of the bosses, are furnished with hairs; the lower part of the sides and the hinder portion of the underside have some irregular blackish markings. The spinners are small, and placed at the extremity of a somewhat tapering prominence of the abdomen, the end of the prominence being encircled by a sort of collar of a coriaceous texture and yellow-brown colour.

A single adult female was received from Ceylon, from Mr. Thwaites, in 1871.

Gen. nov. STEGOSOMA.

Cephalothorax and ocular portion of caput as in *Phoroncidia.*

Eyes as in *Phoroncidia.*

Maxillæ more curved towards the labium.

Labium somewhat semicircular, its apex slightly pointed.

Sternum heart-shaped.

Abdomen, looked at from above, very nearly round, moderately convex on the upperside, and forming a roof or shield over the whole spider. Its epidermis is corneous.

Legs short, moderately strong, and differing but little in their length, which appeared to be (though it was difficult to be certain on the point) relatively 4, 1, 2, 3.

This genus is very nearly allied to *Phoroncidia* (Westw.), and perhaps still more nearly to *Ulesanis* (L. Koch); but I am inclined to think it must be held distinct from either.

STEGOSOMA TESTUDO, sp. n. (Plate XIV. fig. 10.)

Female adult, length 1 line.

When looked at from above, the whole of the cephalothorax, including the prominent ocular portion, is concealed by the enormous development of the corneous covering of the abdomen; but when viewed laterally the caput is seen protruding slightly forwards from beneath the fore margin, like the head of a tortoise; owing to the prominence of the caput, the clypeus is very retreating, and the falces are set far back.

The *eyes* are rather large, and not very unequal in size; they are grouped at the upper extremity of the prominence: as in *Phoroncidia*, four form a central square, near on either side of which is a lateral pair, the foremost eye of each pair being almost contiguous to the fore central eye on its side.

The colour of the cephalothorax and falces is yellow-brown, that of the maxillæ, labium, and sternum yellow, the maxillæ being marked with dark brown near their bases.

The *legs* are rather strong, but short, and when at rest folded inwards and entirely concealed by the abdomen; those of the fourth pair are longer than those of the first, and those of the third pair are the shortest; they are all of a yellow colour, and are furnished with hairs.

The *palpi* are short, slender, and similar to the legs in colour.

The *maxillæ* are very nearly like those of *Phoroncidia*, but are not quite so strong, rather longer, and more curved over the labium.

The *abdomen* is nearly round when looked at from above; but the centre of the fore margin is slightly and obtusely prominent. The surface is corneous, and of a silvery yellowish colour; it is covered with slight shallow but general depressions, giving it an undulating appearance; the lowest part of each depression is indicated by a largish, nearly round or oval, smooth, shining, red-brown, flat scale-like spot, margined with black. The general surface is broken up into small roundish somewhat tuberculous markings, and is covered sparingly with short prominent hairs; the sides and fore part are also speckled with small red-brown points; and the hinder part is transversely rugulose, and marked by some short transverse red-brown dashes. The scale-like spots above mentioned form a single marginal row, with a central quadrangle whose fore side is much the shortest. The underside is yellow, spotted and marked with red-brown; and the spinners occupy the extremity of a large truncated yellow-brown cone, beneath the hinder part of the abdomen.

A single adult female of this very remarkable little Spider was sent me from Ceylon in 1871 by Mr. Thwaites; it seems to bear the same relation to *Phoroncidia* in the family *Theridiides* as *Eurysoma* does to *Gasteracantha* in the family *Epeïrides*.

STEGOSOMA NASUTUM, sp. nov. (Plate XIV. fig. 11.)

Male adult, length $\frac{3}{4}$ line; female, 1 line.

This species is nearly allied to *S. testudo*; but the surface of the abdomen is more uneven or undulating (having several strongish protuberances on its upperside, the strongest protuberance being in the centre), while in general form it resembles it very closely; the fore margin, however, instead of being prominent at the centre, is even with the rest; but the hinder extremity is very slightly prominent.

The caput is produced like that of *S. testudo*, but enlarges a little at the extremity, and is similarly concealed beneath the abdomen; just beneath the eyes is a blunt nose-like prominence, easily visible both from the front and laterally; this prominence is a strong and distinguishing specific character. The eyes are more unequal in size than in the former species, those of the fore central pair being much the largest.

The *legs* are shorter but relatively the same as in *S. testudo*, and their colour is pale brownish yellow, in the female annulated with dark yellow-brown.

The *abdomen* is whitish yellow a good deal suffused with brown; it wants the silvery lustre of *S. testudo*, and is covered more or less with round brownish shallow pock-marks; its surface is also thinly clothed with short hairs; and there is a largish somewhat lyre-shaped brownish patch in the centre of the hinder portion.

The *palpi* are short and strong; the digital joints are large and oval in form, with a strong indentation at the base on the outer side, and their convex sides are directed towards each other; the radial and cubital joints appeared to be very nearly of the same length; the palpal organs are simple, and, as far as they could be seen, consisted of two or three simple corneous lobes.

An adult male and female of this species were received from Ceylon, from Mr. Thwaites, at the same time as the former one.

LIST OF SPECIES, WITH REFERENCES TO PAGE, PLATE, AND FIGURES.

Tetrablemma medioculatum (Cambr.), Ceylon, p. 114, Plate XII. fig. 1.
Pachypus macleayi (id.), ibid., p. 116, Plate XII. fig. 2.
Labdacus monastöides (id.), Rio Grande, p. 118, Plate XII. fig. 3.
Thomisus prosper (id.), hab. ign., p. 119, Plate XIII. fig. 4.
—— *opportunus* (id.), Ceylon, p. 120, Plate XIII. fig. 5.
Amycle forticeps (id.), ibid., p. 122, Plate XIII. fig. 6.
Phoroncidia thwaitesii (id.), ibid., p. 123.
—— *brevispinosa* (id.), ibid., p. 124, Plate XIV. fig. 7.
—— *septemaculeata* (id.), ibid., p. 124, Plate XIV. fig. 8.
—— *trispinosa* (id.), ibid., p. 125, Plate XIV. fig. 9.
Stegosoma testudo (id.), ibid., p. 126, Plate XIV. fig. 10.
—— *nasutum* (id.), ibid., p. 127, Plate XIV. fig. 11.

DESCRIPTION OF THE PLATES.

Plate XII.

Fig. 1. *Tetrablemma medioculatum* (Cambr.), ♂.
a, figure of Spider, magnified; *b*, profile of ditto, with legs and palpi truncated; *c*, underside, without legs and palpi; *d*, abdomen, from behind; *e*, eyes, from above and behind; *f*, left palpus, from beneath and behind; *g*, right palpus, from beneath and in front; *h*, natural length of Spider.

2. *Pachypus macleayi* (Cambr.), ♂ & ♀.
a, Spider, magnified; *b*, ditto in profile; *c*, underside of abdomen; *d*, cephalothorax and falces from the front; *e*, underside showing maxillæ, labium, and sternum; *f*, leg of first pair; *g*, tarsus of legs of fourth pair; *h*, portion of leg of first pair, showing fringes of hairs; *k*, tarsus of leg of first pair; *m*, palpus of ♂; *n*, natural length of Spider.

Fig. 3. *Labdacus monastoides* (Cambr.), ♀.
a, Spider, magnified; *b*, ditto in profile; *c*, cephalothorax, from the front; *d*, maxillæ, labium, and sternum; *e*, portion of tarsus; *f*, genital aperture; *g*, natural length of Spider.

Plate XIII.

Fig. 4. *Thomisus prosper* (Cambr.), ♀.
a, cephalothorax and portion of abdomen, in profile; *b*, cephalothorax, from above and behind; *c*, caput, from the front; *d*, maxillæ, labium, and sternum; *e*, natural size of Spider.

5. *Thomisus opportunus* (Cambr.), ♂ & ♀.
a, ♂, magnified; *b*, ditto, in profile; *c*, abdomen of ♂, from above; *d*, natural length of Spider.

6. *Amycle forticeps* (Cambr.), ♂.
a, Spider, magnified; *b*, cephalothorax and abdomen, in profile; *c*, caput, from the front; *d*, fore part of caput, from behind; *e*, maxillæ and labium; *f*, tarsus; *g*, palpus of ♂; *h*, natural length of Spider.

Plate XIV.

Fig. 7. *Phoroncidia brevispinosa* (Cambr.), ♀.
a, Spider, in profile, magnified; *b*, posterior part of abdomen, from behind; *c*, natural length of Spider.

8. *Phoroncidia septemaculeata* (Cambr.), ♂ & ♀.
a, Spider, in profile, magnified; *b*, posterior part of abdomen, from behind; *c*, one of the falces, ♀, from the front; *d*, profile of cephalothorax, ♂; *e*, natural length of female.

9. *Phoroncidia trispinosa* (Cambr.), ♀.
a, Spider, in profile, magnified; *b*, cephalothorax and abdomen, from above and behind; *c*, natural length of Spider.

10. *Stegosoma testudo* (Cambr.), ♀.
a, Spider, in profile, magnified; *b*, ditto, from the front; *c*, abdomen, from above; *d*, maxillæ, labium, and sternum; *e*, natural length of Spider.

11. *Stegosoma nasutum* (Cambr.), ♂ & ♀.
a, Spider, magnified, from the front; *b*, ditto, in profile; *c*, abdomen, from above; *d*, extremity of caput, in profile; *e*, ditto, from the front, showing the position of the eyes; *f*, natural length of male; *g*, ditto of female.

6. Notice of the Skeleton of the New-Zealand Right Whale (*Macleayius australiensis*) and other Whales, and other New-Zealand Marine Mammalia. By Dr. J. E. Gray, F.R.S. &c.

[Received December 2, 1872.]

Dr. Haast has sent to England the skeleton of a Whale from the coast of New Zealand. This skeleton is now exhibited in the collection of the British Museum. It was believed, when first imported, to be the New-Zealand Whale, described and figured by me in Dr. Dieffenbach's 'Voyage' under the name of *Balæna antipodarum*, which has been formed into the genus *Caperea* on account of the peculiar shape of its ear-bones. The examination of the ear-bones at once showed that it was not of that species, and proved that there were two Right Whales inhabiting the coast of New Zealand.

The ear-bone is so similar to that of *Eubalæna australis* in the

British Museum, said to have come from South Africa, that it seemed that it might be a specimen of that species, showing that the species was common to the Cape of Good Hope and New Zealand. The examination, however, of the mass formed by the cervical vertebræ, and the form of the blade-bone, showed that it was most distinct from the New-Zealand and the Cape Whale; but it was soon apparent that the mass of cervical vertebræ very much resembled a similar specimen in the Australian Museum at Sydney, of which Mr. Krefft had sent me four photographs, which are copied in the 'Catalogue of Seals and Whales,' p. 105, figs. 10 & 11, and p. 372, figs. 74 & 75, and described under the name of *Macleayius australiensis*. The specimen now received chiefly differs from the photographs in the cervical vertebræ being much smaller but more complete, and in the lower processes of the second vertebra being longer and rather tapering at the end; but this may depend upon the age of the specimen, as the end of the process in this specimen is rugose, as if in progress of growth. I am therefore inclined to consider it a specimen of the same species, or genus at least.

The specimen photographed by Mr. Krefft is much larger and probably much more adult than the one we have received from New Zealand, as shown below :—

	Krefft.	Brit. Mus.
Width of atlas..........	about 28 in.	about 19 in.
Width of lower process of 2nd vertebra..........	,, 28½ in.	,, 19 in.
Height from the base of the atlas to the top of crest..	,, 18 in.	,, 15 in.

The atlas vertebræ of the Right Whales have a large crest over the vertebral marrow; but their body is very thin, and becomes thinner on the lower edge, so that it does little more than line the cavity of the condyle. Their lateral processes are expanded; and this vertebra is most intimately united with the following, and has the appearance of forming part of it. The second vertebra is thicker, its upper lateral process is more or less intimately united with the back of the upper part of the process of the atlas, and the lower lateral processes are well developed. Care should be taken not to regard, as very often has been done, the two vertebræ as one, the lateral process of the atlas, the upper lateral process of the second vertebra united to it, and the inferior lateral process of this vertebra as all belonging to a single vertebra. These two vertebræ are quite distinct in younger specimens; and there is always a large aperture upon each side of the neural arch, between the upper part of the lateral processes of the two passages of the nerves.

According to Prof. Flower's figure of the section of the cervical vertebra of the Greenland Whale, in the 'Recent Memoirs on the Cetacea,' p. 149, the neural arches of the second to the sixth cervical vertebræ are all united together above, and quite separate from that of the seventh. In *Macleayius* the first, second, and third are much united together, but the fourth, fifth, sixth, and seventh are only united by the crests—the arch of the fourth and fifth on one side, and fifth and sixth on the other, being more united together above than the rest.

The total length of the vertebræ of the New-Zealand specimen placed close together is 31 feet 6 inches; the length of the head 8 feet 6 inches, but over the curve of the nose 10 feet; the length of the lower jaw 7 feet 8 inches, of the first rib 3 feet 6 inches, and of the middle rib 7 feet 4 inches, as measured by Mr. E. Gerrard, Jun., who observes that "the last small bone of the tail is wanting. There are eight chevron bones present; but I should think there ought to be one or two more small ones. One malar bone and the epiphyses of three vertebræ are wanting. I also think a few of the finger-joints are wanting; but it is difficult to be sure, as some of them are loose and others covered with skin;" but we will determine this point when they are cleaned.

The nasal bone is strap-shaped, more than twice as long as broad, with thick rounded front ends, which are arched out in the middle. It is about 4¼ inches wide.

The skull and lower jaw weigh rather above 5½ cwt., each lower jaw being 90 lb. (See fig. 1, pp. 135–137.)

The ear-bone is very thick, triangular, with three nearly equal sides—which is very like two ear-bones which we have received from South Africa as those of the South-African Whale (*Eubalæna australis*), and the figures of the ear-bones of that species given by Van Beneden (Ost. Cét. t. i. & ii. figs. 13 & 14). The differences between those of the New-Zealand and the Cape Whale are so slight that it would be very difficult to express them in words, and, indeed, to distinguish the specimens from each other. According to Van Beneden, the ear-bones of the young *Eubalæna australis* are much more rounded, and have larger apertures compared with their size than in the adults (see his figure, t. i. & ii. f. 10 & 11).

The *os petrosum* to which the New-Zealand specimen is attached is very like, but rather smaller than, the specimens we have of *Eubalæna australis*, said to have come from the Cape, and like those figured by Van Beneden (Ost. Cét. t. i. & ii. figs. 13 & 14).

We have a pair in the Museum very similar to the Cape and New-Zealand bones, sent to the Museum as the ear-bones of the Sperm-Whale by Mr. H. H. Russell; but they differ from the three other specimens in having a much larger *os petrosum*, and a much longer strap-shaped truncated lobe. It may be observed that the ear-bones figured by M. van Beneden as those of his *Balæna biscayensis* (t. vii. figs. 4–6), which he received from Mr. Cope as the ear-bones of his *Balæna cisarctica*, are very like those of *Eubalæna* and *Macleayius*, and, like them, are much more ventricose than those of the Greenland Whale. Perhaps this led Eschricht to observe that *Balæna biscayensis* was more like *B. australis* than *B. mysticetus*.

Cervical vertebræ all united by their bodies into one mass and to the first dorsal vertebra, and, all but the first dorsal, by the crests of the dorsal processes, which form a high arched ridge, the crest of the second vertebra being much the largest and highest. All the vertebræ are furnished with a superior lateral process, that of the first and second being free at the base and united at the end, that of the first very large, compressed, and truncated at the end; that of the second large, thick, and united to the upper part of the back of the process of the first. The upper lateral processes of the third to the seventh compressed, slender, and free, the third being free halfway up the crest, and others more or less free to the crest itself. The lower process of the atlas or first entirely wanting; that of the second large, thick, but compressed and truncated at the end, but probably, in process of growth, about as prominent as the upper process of the first. The lower process of the third well developed, elongate, straight, much compressed and truncated at the end, about one inch shorter than the large process of the second. The bodies of the fourth to the seventh vertebræ without any indications of inferior lateral processes. The bodies of the third to the seventh vertebræ very thin, not much more than half the thickness of that of the first dorsal vertebra, which is anchylosed to the last cervical vertebra; and its neural arch and upper lateral process, which is similar in form to that of the last cervical vertebra, but much thicker and stronger, are entirely free. The articulating surface of this vertebra is nearly circular, being only a little wider than high. The front of the neural canal is nearly circular, but rather depressed—that is, a little wider than high, but regularly rounded. The canal at the hinder end of the vertebral mass is larger, rounded, but with a rather triangular top, and a little wider than high. (See fig. 2, p. 138.)

The vertebræ are seven cervical and forty-seven dorsal and caudal. The body of the first dorsal vertebra is anchylosed with the body of the seventh cervical; and there may be one or more last caudal vertebræ wanting. This number is much smaller than that of the old and young *Eubalæna australis* figured by M. van Beneden (Ost. Cét. t. i. & ii.), which have 16 dorsal and 37 caudal vertebræ—in all, 53. With regard to number it more nearly agrees with those of the great Northern Whale (*Balæna mysticetus*, Eschricht, Om Nordhwallen, t. ii.), where the figure of the adult male 48 feet long has 49 vertebræ.

The first rib has a single head, and is wider at the sternal end.

The sternum is oblong, rather irregular in shape and thickness, being thicker on one side than on the other, very spongy, or, rather, full of cylindrical tubular cavities. There are three convex cylindrical prominences of nearly equal size, placed without any apparent order on its thick margin. It is rather curved; the upper surface is flat, but the lower one is rather distorted by the unequal thickness of the bone. It is 6½ inches long, and about 5 inches wide. (See fig. 3, p. 139.)

The scapula is triangular, with a rounded end, rather broader than long—that is to say, 25 inches long and 27 inches broad at the wider end. The front margin has a broad compressed acromion process, which is bent towards the articulating surface and acute at the end, with a large arched outline which occupies about half the front margin. The disk of the outer surface is concave, with a large concavity in the middle of the upper half. The inner surface is nearly flat. There is no doubt that this bone is in progress of development; for the terminal edge is very thick and truncated. (See fig. 4, p. 140.)

The history of the New-Zealand Right Whales is an instructive lesson to the zoologist, and shows how apt we are to trust to an assumption.

The older circumnavigators, as Capt. Cook and others, spoke of a Right Whale being observed near New Zealand. Dr. Dieffenbach brought home with him a beautiful drawing of a Right Whale, made from a female specimen 60 feet long taken on the coast of New Zealand, in Jackson's Bay. I published a reduced copy of this drawing in his work on New Zealand under the name of *Balæna antipodarum*, and a plate in the 'Voyage of the Erebus and Terror' under the name of *Balæna antarctica*, a name which had been already used for another species by Lesson and Owen.

Mr. Stuart presented to the Museum the ear-bone of a Whale from Otago, which I described and figured in the P. Z. S. 1864, p. 202, under the name of *Caperea*. This figure is copied in the 'Catalogue of Seals and Whales,' p. 101, f. 9; and believing that there was only one Right Whale in New Zealand, I regarded it as the ear-bone of the Whale I had figured, and called it *Caperea antipodarum**.

The skeleton of an adult female Whale, obtained by Capt. Berard in the Bay of Acaroa, near Banks Island, in New Zealand, was presented to the Paris Museum. According to M. van Beneden it was for a long time kept in the warehouse of the Institution, and regarded as of the same species as the *Balæna australis* brought from the Cape of Good Hope by Lalande; and M. Laurillard was so persuaded of its identity that he offered to exchange it with M. Eschricht for the skeleton of a Greenland Whale (Ost. Cét. p. 46). It is exhibited in the court of the Museum of Comparative Anatomy in the Jardin des Plantes, and named *B. australis*. Prof. Lilljeborg, who was in Paris in 1863, says that the specimen was not set up; but it has since (1865) been mounted, according to Mr. Flower. Prof. Lilljeborg, in a letter to me, printed in the additions to the 'Catalogue of Seals and Whales,' observes that "it is quite different from the *B. australis* of Desmoulins and Cuvier, from the Cape, and is, without doubt, the *Eubalæna antipodarum* of Gray. The blade-bone is of very distinct form, and has the rudiment of an acromion. The *ear-bones are lost*,"—one of these being the single bone upon which the genus and species were established.

M. van Beneden, who speaks of this skeleton as complete, in the 'Ostéographie des Cétacés,' adopts Lilljeborg's determination, and figures several bones, no doubt taken from the specimen in the Jardin des Plantes, under the name of *Balæna antipodarum*, not saying a word as to the skeleton being without the ear-bones, but giving three figures of two ear-bones, evidently derived from other sources. He says he has seen several ear-bones of this species, and that they are all alike. He also says there are three ear-bones in the Museum of Brussels (one of them being young), brought from

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* Dr. Hector has now determined that this ear-bone belongs to *Neobalæna marginata* (Ann. & Mag. Nat. Hist. 1873, vol. xi. p. 108).

New Zealand by M. Duchange. He does not say from which specimen his figures were taken; but they are probably from the old and young in Brussels. Neither of the figures represents the ear-bones of either of the two Whales (*Caperea antipodarum* and *Macleayius australiensis*) which we have received from New Zealand. Do the ear-bones figured really come from New Zealand? If they do, they indicate the existence of another New-Zealand Right Whale.

M. van Beneden gives *Balæna australis*, Desmoulins, 'Dictionnaire classique d'Histoire Naturelle,' p. 161, as a synonym of the New-Zealand species; but M. Desmoulins remarks, this species was "observée par de Lalande," who collected it at Algoa Bay.

Unfortunately there is no other skeleton known of the *Balæna antipodarum* than that which is in the Paris Museum, which wants the ear-bones on which the genus was founded. I am inclined to think it most probable that the skeleton at Paris does belong to *Caperea*, because, like the ear-bones which are the type of the genus, the skeleton, from the form of its blade-bone &c., is evidently referable to a peculiar group of the Right Whales; whilst the two kinds of ear-bones figured by M. van Beneden as belonging to that skeleton are both of the type usually found in the common form of Right Whales. It is to be regretted that the figures of the ear-bones given by M. van Beneden in the work above referred to are not very satisfactory, and do not give the impression that either he or his artist has very carefully studied them; and one of the great wants of the text of his book is that his descriptions should be more detailed and taken from a single skeleton; and when he describes a specimen from any other source it should be described separately, as otherwise he is apt to describe the bones of several distinct animals as belonging to one species, as he certainly has done in more than one instance, especially in his *Balæna antipodarum* and *B. biscayensis*.

We have received the skeleton of a second species of Right Whale from New Zealand, which was believed by Dr. Haast and the New-Zealand zoologists to be the same as the one described and figured as *Caperea antipodarum*; but it is even more like, though quite distinct from, *Eubalæna australis* (the Cape Right Whale); and I now describe it as *Macleayius australiensis*; but the discovery of this Whale has thrown doubts on all our previous assumptions; and the ear-bones figured by M. van Beneden, if they are really from New Zealand, make the determination of the species even more doubtful.

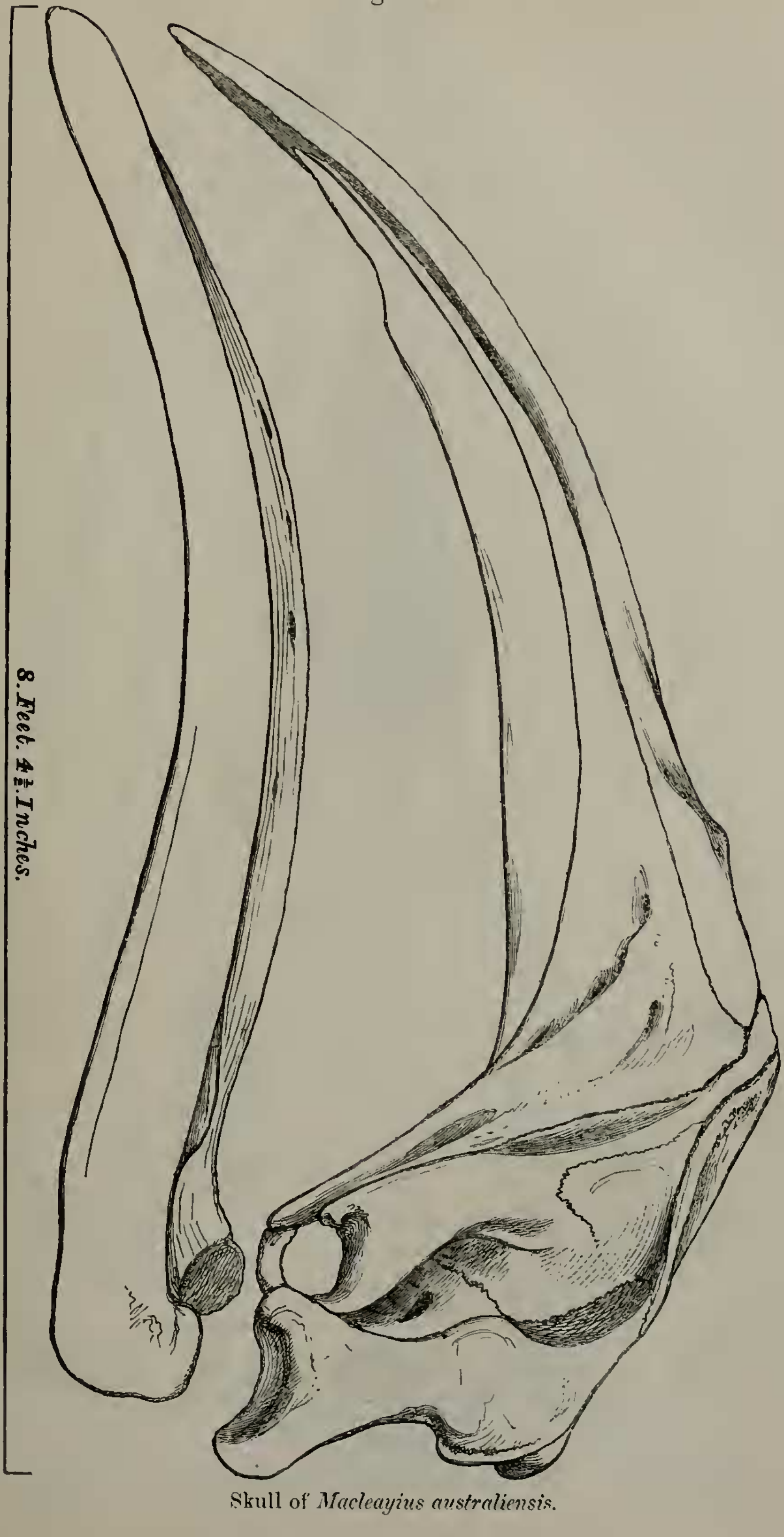
In these remarks I have taken no notice of the Pigmy Right Whale (*Neobalæna marginata*), found in New Zealand and West Australia, because that is at once known from all the others by its small size.

MACLEAYIUS AUSTRALIENSIS.

Macleayius australiensis, Gray, Cat. Seals and Whales, p. 105, f. 10 & 11, p. 371, f. 74 & 75 (from Krefft's photographs); Suppl. Cat. Seals and Whales, p. 46; Synopsis of Whales and Dolphins, p. 2.

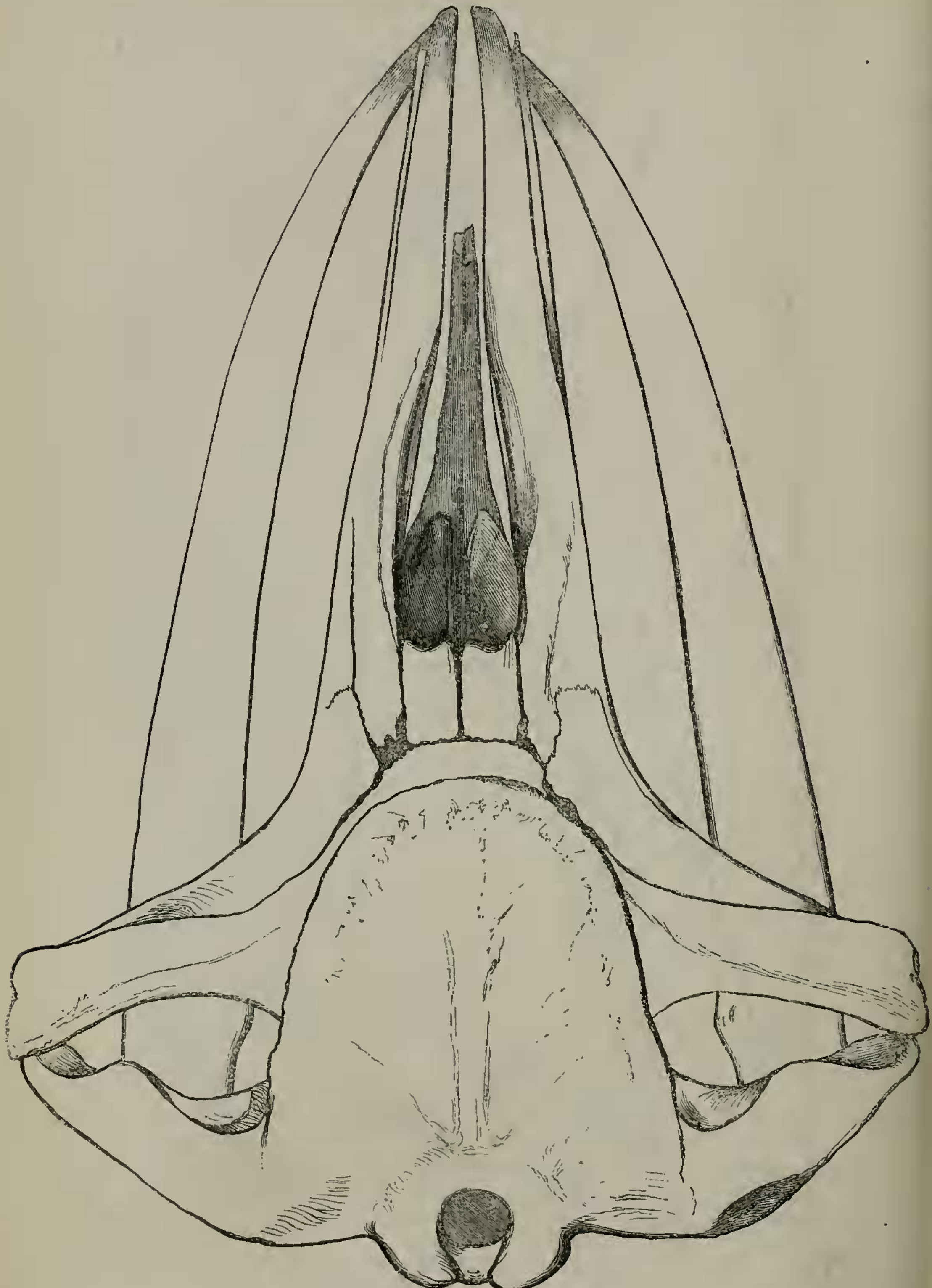
Hab. Australian Seas (*Krefft*), Coast of New Zealand (*Dr. Haast*).

Fig. 1 *a*.



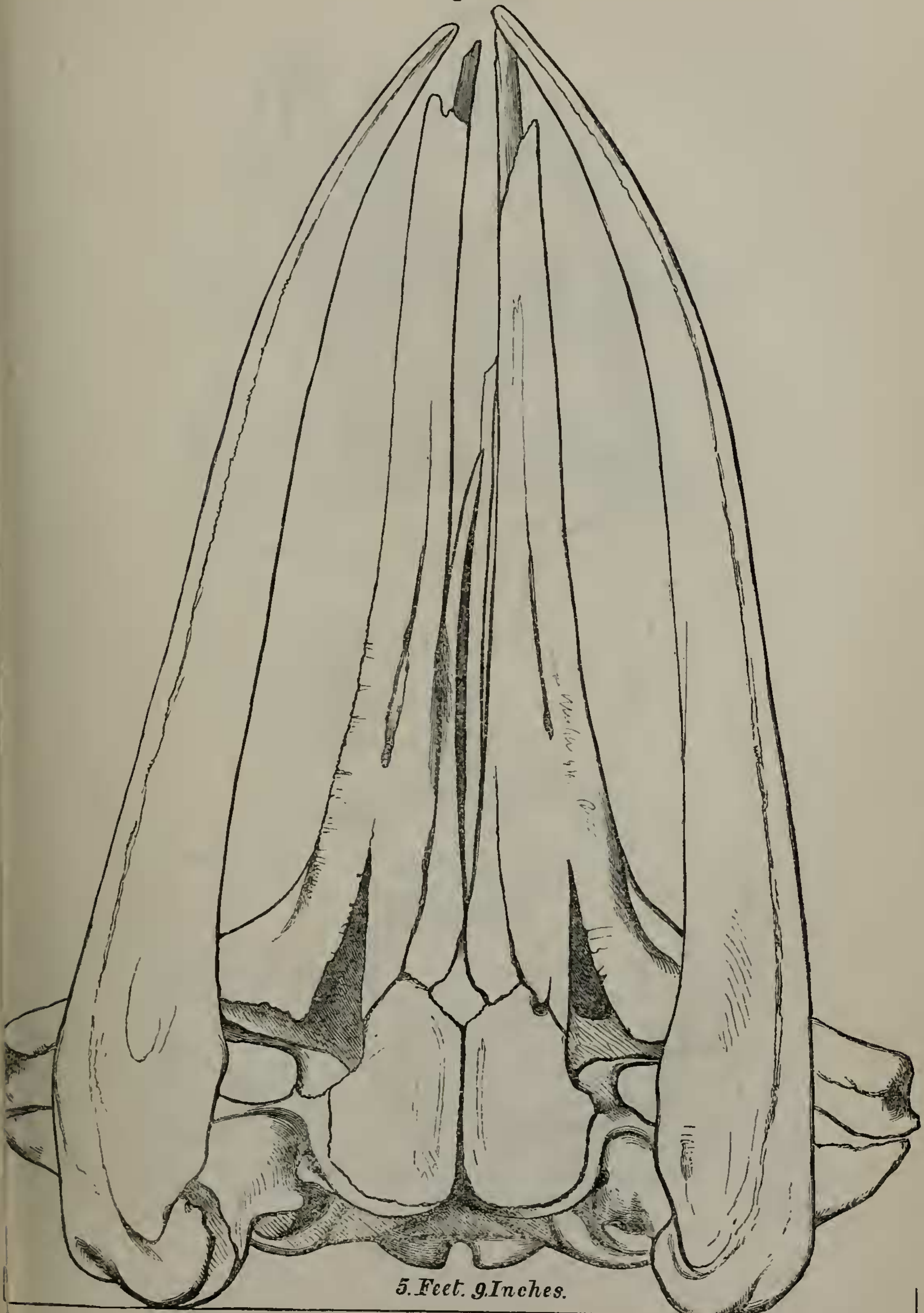
Skull of *Macleayius australiensis*.

Fig. 1*b*.



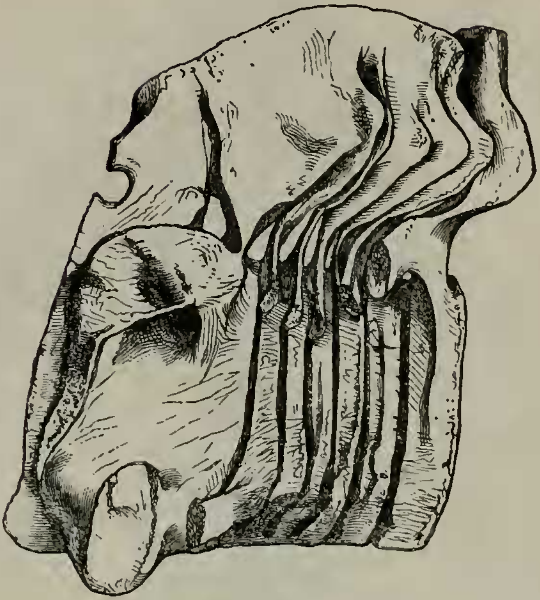
Skull of *Macleayius australiensis*.

Fig. 1*c*.



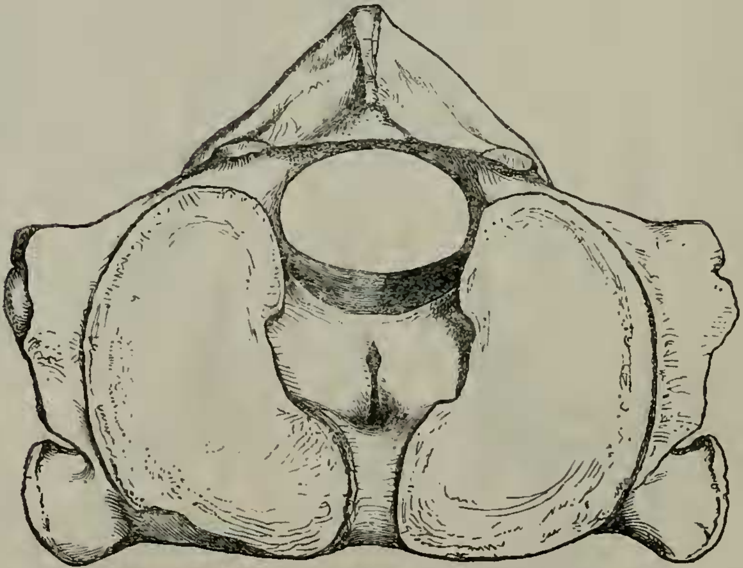
Skull of *Macleayius australiensis*.

Fig. 2 *a*.



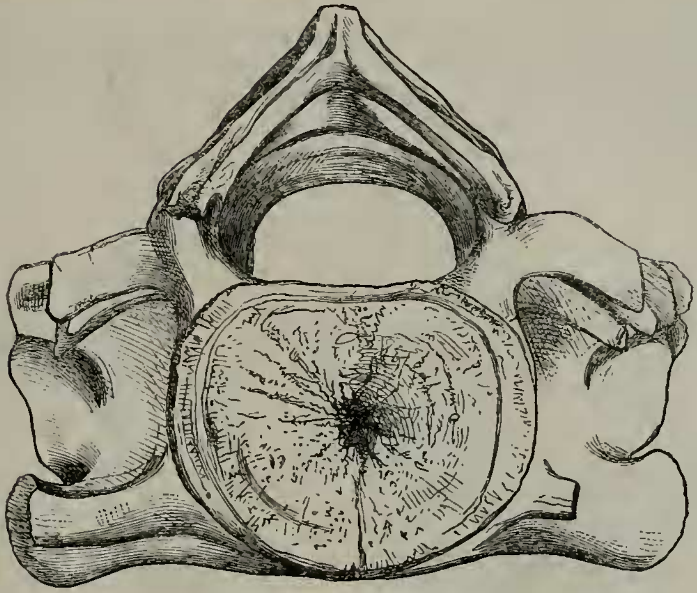
Cervical vertebræ of *Macleayius australiensis* (side view).

Fig. 2 *b*.



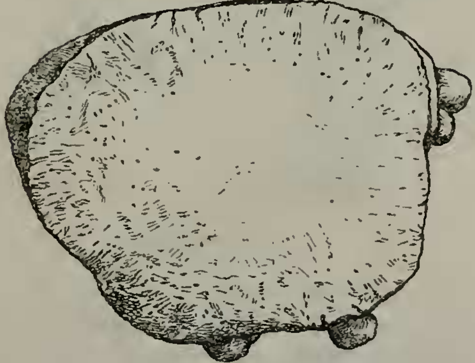
Cervical vertebræ of *Macleayius australiensis* (front view).

Fig. 2 *c*.



Cervical vertebræ of *Macleayius australiensis* (back view).

Fig. 3.

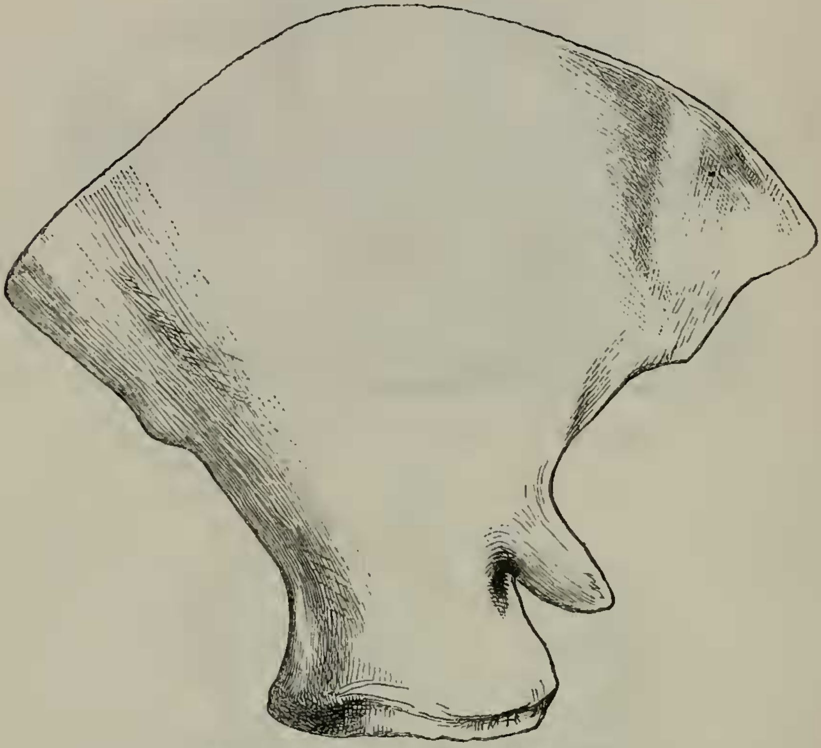


Sternum of *Macleayius australiensis*.

In the British Museum there is a mass of cervical vertebræ which was dredged up at Lyme Regis, on the coast of Dorsetshire. It is described at length and figured in the Cat. Seals and Whales Brit. Mus. p. 83, f. 3, as belonging to an unknown species of *Balæna*. The figure is copied in M. van Beneden's 'Ostéographie,' t. viii. f. 7, and referred to *Balæna biscayensis*. In the Ann. & Mag. Nat. Hist. (vol. vi. pp. 198, 204, 1870) I called it *Balæna britannica* or *Macleayius britannicus*; and it appears under the latter name in the Suppl. Cat. Seals and Whales, p. 46. Now we have the mass of cervical vertebræ of the original *Macleayius* from New Zealand, it is quite clear that the vertebræ from Lyme Regis do not belong to that genus, and are indicative of a peculiar group, for which I propose the name of *Halibalæna*.

The width of the atlas and lateral processes is 28 inches, and of the lower lateral processes and the second vertebra 27 inches, the height to the top of the crest about 16 inches.

Fig. 4.



Scapula of *Macleayius australiensis* (inside).

The peculiarity of the genus *Halibalæna* is that the lateral process of the atlas is broad and expanded, long at the top, and gradually shorter below, with an oblique descending outer margin (see figure, Cat. Seals and Whales, p. 83, f. 3). The upper lateral process of the second vertebra is broad, united to the hinder margin of the atlas; the lower process broad and bent up at the end, nearly as long as the lateral process of the atlas. The upper lateral processes of the third, fourth, and fifth vertebræ small, dilated at the end, and more or less anchylosed; the lower lateral process of each vertebra similar, but much smaller and shorter.

HALIBALÆNA BRITANNICA. (Fig. 5, p. 141, cervical vertebræ.)

Balæna —— (from Lyme Regis), Gray, Cat. Seals and Whales, p. 83, f. 3. (cervical vertebræ).

Balæna biscayensis (part.),Van Beneden, Ost. Cét. t. vii. f. 7 (cervical vertebræ, badly copied from the above-cited figure).

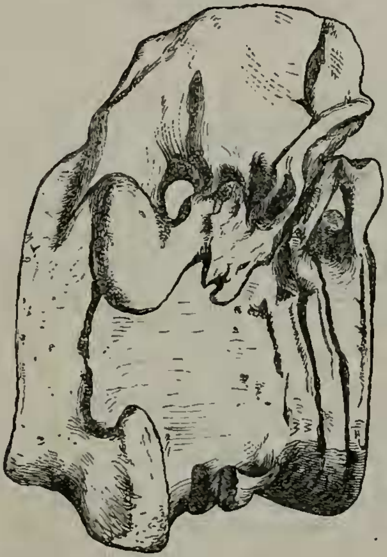
Balæna britannica, Gray, Ann. & Mag. Nat. Hist. 1870, vol. vi. p. 200.

Macleayius britannicus, Gray, Ann. & Mag. Nat. Hist. 1870, vi. pp. 198, 204; Suppl. Cat. Seals and Whales, p. 46.

Hab. British Channel ?, Lyme Regis.

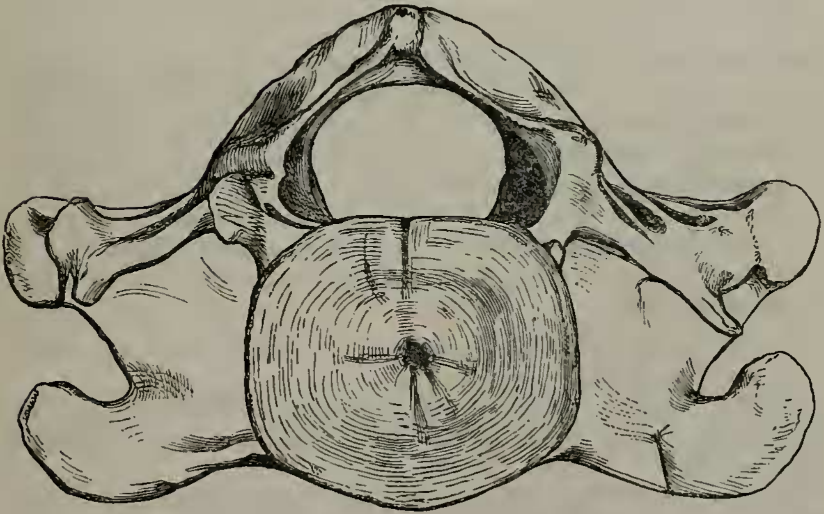
This is probably a Mediterranean or temperate-ocean species, migrating to, or occasionally visiting the south coast of England, or subfossil.

Fig. 5*a*.



Cervical vertebræ of *Halibalæna britannica* (side view).

Fig. 5 *b*.



Cervical vertebræ of *Halibalæna britannica* (back view).

The Right Whales may be formed into two very distinct groups:—

I. *Scapula about as broad as long, acromion process distinct. Tympanic bone rhombic; aperture slightly contracted at the upper end, about two thirds the length of the bone.*

A. The first rib with a single head and slightly dilated and truncated at the sternal end.

* The lateral lobes of the atlas broad, truncated. The four hinder cervical vertebræ without any inferior process.

BALÆNA. Acromion process elongate, broad at the end; coracoid process broad. Ear-bone compressed on edge. (Ost. Cét. t. iv., v.)

MACLEAYIUS. Acromion process small, acute at the end; coracoid process none. Ear-bones thick. (Figs. 1–4, p. 135–140.)

** The lateral lobes of the atlas broad and truncated. The fourth and fifth cervical vertebræ with rudimentary inferior processes, and the seventh without any. (Van Beneden, Ost. Cét. t. vii. f. 9, 11.) *Balæna mediterranea*, Gray, Suppl. Cat. Seals and Whales, p. 38; *B. biscayensis* (part.), Van Beneden, Ost. Cét. t. vi. f. 1 & 8–11. *Hab.* Mediterranean Sea.

*** Lateral processes of the atlas broad, with the lower edge obliquely truncated. The three hinder cervical vertebræ without any lower processes. (Cat. Seals and Whales, p. 83, f. 3.) *Halibalæna britannica.* (Fig. 5, p. 141.)

**** Lateral processes of the atlas subcylindrical, rounded at the end. The lower process of the second vertebra rounded, the third vertebra having a very rudimentary lower process, and the other without any. (Catal. Cet. i. ii., f. 19.) *Eubalæna australis.*

B. First rib double-headed and dilated and notched at the end. (Gray, Cat. Seals and Whales, p. 99, f. 8.) *Hunterius temminckii.*

II. *Scapula elongate, longer than broad, only a ridge in the place of the acromion process. First rib much dilated and deeply notched at the sternal end. The lateral processes of the atlas moderate, strap-shaped. The lower processes of the second vertebra large, elongate, rounded at the end, of the third to the sixth small, cylindrical, rudimentary; the seventh without inferior processes.* (Ostéogr. Cét. t. iii., except figs. 12, 13, & 14.) *Caperea antipodarum*, Gray, Catal. Seals and Whales, Suppl. p. 45.

The cervical vertebræ of *Neobalæna* are unknown, as are those of several other Whales.

The fauna of New Zealand, as regards marine Mammalia, is extending, and, I have no doubt, will be found to be much richer as it is more studied.

For example, we have not yet had the "Sulphur-bottom" or the "Trigger" of New-Zealand whalers; and there are other specie of marine mammals mentioned as found in those seas, but in such a manner as not to be able to be entered in scientific catalogues. There are many more species recorded as inhabiting Australian seas, which no doubt range as far as New Zealand; but I have only inserted those on the authority of specimens.

1. STENORHYNCHUS LEPTONYX. (The Sea-Leopard.)

Stenorhynchus leptonyx, Gray, Catal. of Seals and Whales, p. 16; Webb, Trans. New-Zeal. Inst. ii. p. 29; Fraser, *l. c.* p. 33.
Hab. New Zealand; Port Nicholson (*Dr. F. Knox*).
Skull in British Museum.

2. ARCTOCEPHALUS CINEREUS. (The Grey Australian Fur-Seal.)

Otaria cinerea, Péron & Lesueur; Quoy & Gaimard, Voy. Astrolabe, t. xii., xiii., xiv.; Hector, Trans. New-Zealand Inst. iv. p. 12, f. 1 (skull), not of Gray, Suppl. Cat. Whales, p. 24.
Phoca ursina, Forster, Cook's Voy. t.
Otaria forsteri, Lesson, Dict. Cl. d'Hist. Nat. xiii. p. 421.
Phoca forsteri, Fischer, Syn. Mamm. p. 232.
Hab. New Zealand, Milford Sound (*Hector*).
Skull in Wellington Mus. and Brit. Mus.

3. GYPSOPHOCA SUBTROPICALIS. (The small Fur-Seal.)

Gypsophoca subtropicalis, Gray, P. Z. S. 1872.
Arctocephalus cinereus, Gray, Suppl. Catal. Seals and Whales, p. 24.
Arctocephalus cinereus (young), Hector, Trans. N. Z. Inst. iv. t. xii. f. 2.
Hab. New Zealand, Auckland Is. (*Hector*).
Skull, Mus. Wellington; North Australia (*MacGillivray*). Specimens in British Museum, from North Australia.

4. NEOBALÆNA MARGINATA.

Neobalæna marginata, Gray, Catal. Seals and Whales, p. 90; Suppl. p. 40, figs. 1 & 2 (skull); Hector, Trans. N. Zeal. Inst. ii. p. 26, 1869, t. ii. B. figs. 1–4.
Caperea antipodarum, Gray, Cat. Whales, p. 101, f. 9 (ear-bone).
Hab. New Zealand, island of Kawau, and W. Australia.
Skull, Mus. Wellington, Otago. Ear-bone, British Museum.

5. CAPEREA ANTIPODARUM.

Caperea antipodarum, Gray, Catal. Seals and Whales, Suppl. p. 45.
Hab. New Zealand.
Skeleton, Mus. Paris.

6. MACLEAYIUS AUSTRALIENSIS.

Macleayius australiensis, Gray, Catal. Seals and Whales, p. 105, f. 10, 11, & p. 371, f. 74, 75; P. Z. S. 1873, figs.
Hab. New Zealand (*Dr. Haast*).
Skeleton, British Museum.

7. ——.

Balæna antipodarum (ear-bones only), Van Beneden, Ost. Cét. t. iii. f. 12–14.

Hab. New Zealand (ear-bones in Brussels Mus.).

8. MEGAPTERA NOVÆ-ZEALANDIÆ.

Megaptera novæ-zealandiæ, Gray, Catal. Seals and Whales, p. 128, f. 20 (ear-bone and os petrosum).

Hab. New Zealand (ear-bone and os petrosum), Brit. Museum.

The "Trigger" fin (*Rorqualus,* sp., of Knox, New Zeal. Inst. ii. p. 25), belongs to this family; but the osteology was not studied, and no specimens have yet reached the British Museum.

9. ELECTRA CLANCULA.

Electra clancula, Gray, Suppl. Catal. Seals and Whales, p. 77.

Lagenorhynchus clanculus, Hector, Trans. N. Zeal. Inst. ii. 1870, p. 27.

Delphinus superciliosus, Lesson (fide Malm).

Hab. New Zealand. Skeleton, Mus. Wellington.

10. GLOBIOCEPHALUS MACRORHYNCHUS.

Globiocephalus macrorhynchus, Gray, Catal. Seals and Whales, p. 320; Gervais, Ost. Cét. t. 52; Hector, Trans. N. Z. Inst. ii. 1870, p. 38.

Hab. New Zealand; two skulls in Mus. Wellington.

11. BELUGA ——.

——?, Hector, Ann. & Mag. N. H. 1872, ix. p. 438.

Hab. New Zealand; Wellington (*Hector*).

This is very likely *Beluga kingii,* Gray, Catal. Seals and Whales, p. 300; Syn. Whales and Dolphins, p. 9, f. 7 (skull), of which we have a skull in the British Museum from Australia brought home by Capt. Parker King, R.N.

12. BERARDIUS ARNUXI.

Berardius arnuxi, Gray, Catal. Seals and Whales, p. 348, fig. 70 (skull); Gervais, Ostéogr. Cét. (skull); Knox and Hector, Trans. N. Zeal. Inst. ii. p. 27, iii. p. 125, f. 16 & 17; Haast, Trans. New Zeal. Inst. i. p. 190.

Hab. New Zealand; Port Nicholson; Porirna Harbour (*Knox*); Canterbury (*Dr. Haast*).

Skeleton in Mus. Roy. Coll. Surg.

The front of the lower jaw is slender, with a slightly curved outline in front and no marked gonyx.

13. BERARDIUS HECTORI.

Berardius hectori, Gray, Ann. & Mag. N. Hist. 1871, viii. p. 117.

Berardius arnuxii (part.), Knox and Hector, Trans. N. Z. Inst. iii. p. 108, f. 14 & 15.

Hab. Cook's Straits; Titai Bay (*Knox*). Length 9 feet.